SERVICE MANUAL

AIR-CONDITIONER SPLIT TYPE

INDOOR UNIT

<DIGITAL INVERTER>

RAV-SM564UT-E RAV-SM1104UT-E

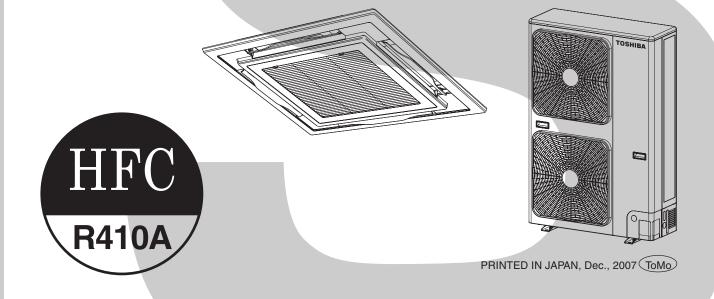
RAV-SM804UT-E RAV-SM1404UT-E

OUTDOOR UNIT

<SUPER DIGITAL INVERTER>

RAV-SP1104AT-E RAV-SP1104ATZ-E RAV-SP1404ATZ-E

RAV-SP1404AT-E RAV-SP1104ATZG-E RAV-SP1404ATZG-E



Adoption of New Refrigerant

This Air Conditioner is a new type which adopts a new refrigerant HFC (R410A) instead of the conventional refrigerant R22 in order to prevent destruction of the ozone layer.

WARNING

Cleaning of the air filter and other parts of the air filter involves dangerous work in high places, so be sure to have a service person do it. Do not attempt it yourself.

The cleaning diagram for the air filter is there for the service person, and not for the customer.

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SAFETY CAUTION

The important contents concerned to the safety are described on the product itself and on this Service Manual. Please read this Service Manual after understanding the described items thoroughly in the following contents (Indications/Illustrated marks), and keep them.

[Explanation of indications]

Indication Explanation			
⚠ DANGER	Indicates contents assumed that an imminent danger causing a death or serious injury of the repair engineers and the third parties when an incorrect work has been executed.		
⚠ WARNING	Indicates possibilities assumed that a danger causing a death or serious injury of the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.		
⚠ CAUTION	Indicates contents assumed that an injury or property damage (*) may be caused on the repair engineers, the third parties, and the users due to troubles of the product after work when an incorrect work has been executed.		

^{*} Property damage: Enlarged damage concerned to property, furniture, and domestic animal/pet

[Explanation of illustrated marks]

Mark	Explanation
\Diamond	Indicates prohibited items (Forbidden items to do) The sentences near an illustrated mark describe the concrete prohibited contents.
0	Indicates mandatory items (Compulsory items to do) The sentences near an illustrated mark describe the concrete mandatory contents.
\triangle	Indicates cautions (Including danger/warning) The sentences or illustration near or in an illustrated mark describe the concrete cautious contents.

[Confirmation of warning label on the main unit]

Confirm that labels are indicated on the specified positions (Refer to the Parts disassembly diagram (Outdoor unit).)

If removing the label during parts replace, stick it as the original.

	<u></u> DANGER
	Turn "OFF" the breaker before removing the front panel and cabinet, otherwise an electric shock is caused by high voltage resulted in a death or injury.
Q	During operation, a high voltage with 400V or higher of circuit (*) at secondary circuit of the high-voltage transformer is applied.
Turn off breaker.	If touching a high voltage with the naked hands or body, an electric shock is caused even if using an electric insulator.
	* : For details, refer to the electric wiring diagram.
Ω	When removing the front panel or cabinet, execute short-circuit and discharge between high-voltage capacitor terminals.
Execute discharge between terminals.	If discharge is not executed, an electric shock is caused by high voltage resulted in a death or injury. After turning off the breaker, high voltage also keeps to apply to the high-voltage capacitor.
\Diamond	Do not turn on the breaker under condition that the front panel and cabinet are removed. An electric shock is caused by high voltage resulted in a death or injury.
Prohibition	

	<u></u> MARNING
Check earth wires.	Before troubleshooting or repair work, check the earth wire is connected to the earth terminals of the main unit, otherwise an electric shock is caused when a leak occurs. If the earth wire is not correctly connected, contact an electric engineer for rework.
Prohibition of modification.	Do not modify the products. Do not also disassemble or modify the parts. It may cause a fire, electric shock or injury.
Use specified parts.	For spare parts, use those specified (*). If unspecified parts are used, a fire or electric shock may be caused. *: For details, refer to the parts list.
Do not bring a child close to the equipment.	Before troubleshooting or repair work, do not bring a third party (a child, etc.) except the repair engineers close to the equipment. It causes an injury with tools or disassembled parts. Please inform the users so that the third party (a child, etc.) does not approach the equipment.
Insulating measures	Connect the cut-off lead wires with crimp contact, etc, put the closed end side upward and then apply a water-cut method, otherwise a leak or production of fire is caused at the users' side.
No fire	 When repairing the refrigerating cycle, take the following measures. 1) Be attentive to fire around the cycle. When using a gas stove, etc, be sure to put out fire before work; otherwise the oil mixed with refrigerant gas may catch fire. 2) Do not use a welder in the closed room. When using it without ventilation, carbon monoxide poisoning may be caused. 3) Do not bring inflammables close to the refrigerant cycle, otherwise fire of the welder may catch the inflammables.
Refrigerant	Check the used refrigerant name and use tools and materials of the parts which match with it. For the products which use R410A refrigerant, the refrigerant name is indicated at a position on the outdoor unit where is easy to see. To prevent miss-charging, the route of the service port is changed from one of the former R22. For an air conditioner which uses R410A, never use other refrigerant than R410A. For an air conditioner which uses other refrigerant (R22, etc.), never use R410A. If different types of refrigerant are mixed, abnormal high pressure generates in the refrigerating cycle and an injury due to breakage may be caused. Do not charge refrigerant additionally. If charging refrigerant additionally when refrigerant gas leaks, the refrigerant composition in the refrigerating cycle changes resulted in change of air conditioner characteristics or refrigerant over the specified standard amount is charged and an abnormal high pressure is applied to the inside of the refrigerating cycle resulted in cause of breakage or injury. Therefore if the refrigerant gas leaks, recover the refrigerant in the air conditioner, execute vacuuming, and then newly recharge the specified amount of liquid refrigerant. In this time, never charge the refrigerant over the specified amount. When recharging the refrigerant in the refrigerating cycle, do not mix the refrigerant or air other than R410A into the specified refrigerant. If air or others is mixed with the refrigerant gas does not leak. If the refrigerant gas leaks in the room, poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. Never recover the refrigerant into the outdoor unit. When the equipment is moved or repaired, be sure to recover the refrigerant with recovering device. The refrigerant cannot be recovered in the outdoor unit; otherwise a serious accident such as breakage or injury is caused.
Assembly/Cabling	After repair work, surely assemble the disassembled parts, and connect and lead the removed wires as before. Perform the work so that the cabinet or panel does not catch the inner wires. If incorrect assembly or incorrect wire connection was done, a disaster such as a leak or fire is caused at user's side.

	⚠ WARNING
Insulator check	After the work has finished, be sure to use an insulation tester set (500V Megger) to check the resistance is $2M\Omega$ or more between the charge section and the non-charge metal section (Earth position). If the resistance value is low, a disaster such as a leak or electric shock is caused at user's side.
Ventilation	When the refrigerant gas leaks during work, execute ventilation. If the refrigerant gas touches to a fire, poisonous gas generates. A case of leakage of the refrigerant and the closed room full with gas is dangerous because a shortage of oxygen occurs. Be sure to execute ventilation.
Be attentive to electric shock	When checking the circuit inevitably under condition of the power-ON, use rubber gloves and others not to touch to the charging section. If touching to the charging section, an electric shock may be caused.
Compulsion	When the refrigerant gas leaks, find up the leaked position and repair it surely. If the leaked position cannot be found up and the repair work is interrupted, pump-down and tighten the service valve, otherwise the refrigerant gas may leak into the room. The poisonous gas generates when gas touches to fire such as fan heater, stove or cocking stove though the refrigerant gas itself is innocuous. When installing equipment which includes a large amount of charged refrigerant such as a multi air conditioner in a sub-room, it is necessary that the density does not the limit even if the refrigerant leaks. If the refrigerant leaks and exceeds the limit density, an accident of shortage of oxygen is caused. For the installation/moving/reinstallation work, follow to the Installation Manual. If an incorrect installation is done, a trouble of the refrigerating cycle, water leak, electric shock or fire is caused.
Check after rerair	After repair work has finished, check there is no trouble. If check is not executed, a fire, electric shock or injury may be caused. For a check, turn off the power breaker. After repair work (installation of front panel and cabinet) has finished, execute a test run to check there is no generation of smoke or abnormal sound. If check is not executed, a fire or an electric shock is caused. Before test run, install the front panel and cabinet.
Check after reinstallation	Check the following items after reinstallation. 1) The earth wire is correctly connected. 2) The power cord is not caught in the product. 3) There is no inclination or unsteadiness and the installation is stable. If check is not executed, a fire, an electric shock or an injury is caused.

	⚠ CAUTION
Put on gloves	Be sure to put on gloves (*) during repair work. If not putting on gloves, an injury may be caused with the parts, etc. (*) Heavy gloves such as work gloves
0	When the power was turned on, start to work after the equipment has been sufficiently cooled.
Cooling check	As temperature of the compressor pipes and others became high due to cooling/heating operation, a burn may be caused.

New Refrigerant (R410A)

This air conditioner adopts a new HFC type refrigerant (R410A) which does not deplete the ozone layer.

1. Safety Caution Concerned to New Refrigerant

The pressure of R410A is high 1.6 times of that of the former refrigerant (R22).

Accompanied with change of refrigerant, the refrigerating oil has been also changed.

Therefore, be sure that water, dust, the former refrigerant or the former refrigerating oil is not mixed into the refrigerating cycle of the air conditioner with new refrigerant during installation work or service work.

If an incorrect work or incorrect service is performed, there is a possibility to cause a serious accident.

Use the tools and materials exclusive to R410A to purpose a safe work.

2. Cautions on Installation/Service

- 1) Do not mix the other refrigerant or refrigerating oil.
 - For the tools exclusive to R410A, shapes of all the joints including the service port differ from those of the former refrigerant in order to prevent mixture of them.
- 2) As the use pressure of the new refrigerant is high, use material thickness of the pipe and tools which are specified for R410A.
- 3) In the installation time, use clean pipe materials and work with great attention so that water and others do not mix in because pipes are affected by impurities such as water, oxide scales, oil, etc.
 - Use the clean pipes.
 - Be sure to brazing with flowing nitrogen gas. (Never use gas other than nitrogen gas.)
- 4) For the earth protection, use a vacuum pump for air purge.
- 5) R410A refrigerant is azeotropic mixture type refrigerant.
 - Therefore use liquid type to charge the refrigerant. (If using gas for charging, composition of the refrigerant changes and then characteristics of the air conditioner change.)

3. Pipe Materials

For the refrigerant pipes, copper pipe and joints are mainly used.

It is necessary to select the most appropriate pipes to conform to the standard.

Use clean material in which impurities adhere inside of pipe or joint to a minimum.

1) Copper pipe

<Piping>

The pipe thickness, flare finishing size, flare nut and others differ according to a refrigerant type.

When us#ing a long copper pipe for R410A, it is recommended to select "Copper or copper-base pipe without seam" and one with bonded oil amount 40mg/10m or less.

Also do not use crushed, deformed, discolored (especially inside) pipes.

(Impurities cause clogging of expansion valves and capillary tubes.)

<Flare nut>

Use the flare nuts which are attached to the air conditioner unit.

2) Joint

The flare joint and socket joint are used for joints of the copper pipe.

The joints are rarely used for installation of the air conditioner. However clear impurities when using them.

4. Tools

1. Required Tools for R410A

Mixing of different types of oil may cause a trouble such as generation of sludge, clogging of capillary, etc. Accordingly, the tools to be used are classified into the following three types.

- 1) Tools exclusive for R410A (Those which cannot be used for conventional refrigerant (R22))
- 2) Tools exclusive for R410A, but can be also used for conventional refrigerant (R22)
- 3) Tools commonly used for R410A and for conventional refrigerant (R22)

The table below shows the tools exclusive for R410A and their interchangeability.

Tools exclusive for R410A (The following tools for R410A are required.)

Tools whose specifications are changed for R410A and their interchangeability

				110A ner installation	Conventional air conditioner installation	
No.	Used tool	Usage	Existence of new equipment for R410A	Whether conventional equipment can be used	Whether conventional equipment can be used	
1	Flare tool	Pipe flaring	Yes	*(Note)	Yes	
2	Copper pipe gauge for adjusting projection margin	Flaring by conventional flare tool	Yes	*(Note)	*(Note)	
3	Torque wrench	Connection of flare nut	Yes	No	No	
4	Gauge manifold	Evacuating, refrigerant	Yes	No	No	
(5)	Charge hose	charge, run check, etc.	ies	INO	INO INO	
6	Vacuum pump adapter	Vacuum evacuating	Yes	No	Yes	
7	Electronic balance for refrigerant charging	Refrigerant charge	Yes	Yes	Yes	
8	Refrigerant cylinder	Refrigerant charge	Yes	No	No	
9	Leakage detector	Gas leakage check	Yes	No	Yes	
100	Charging cylinder	Refrigerant charge	No	No	No	

(Note) When flaring is carried out for R410A using the conventional flare tools, adjustment of projection margin is necessary. For this adjustment, a copper pipe gauge, etc. are necessary.

General tools (Conventional tools can be used.)

In addition to the above exclusive tools, the following equipments which serve also for R22 are necessary as the general tools.

- Vacuum pump
 Use vacuum pump by
 attaching vacuum pump adapter.
- 2) Torque wrench
- 3) Pipe cutter
- 4) Reamer
- 5) Pipe bender
- 6) Level vial

- 7) Screwdriver (+, -)
- 8) Spanner or Monkey wrench
- 9) Hole core drill
- 10) Hexagon wrench (Opposite side 4mm)
- 11) Tape measure
- 12) Metal saw

Also prepare the following equipments for other installation method and run check.

- 1) Clamp meter
- 2) Thermometer

- 3) Ilnsulation resistance tester (Megger)
- 4) Electroscope

1. SPECIFICATIONS

1-1. Indoor Unit

1-1-1. 4-Way Air Discharge Cassette Type

<Single type>

	Madal	Model		RAV-SM	564UT-E	804UT-E	1104UT-E	1404UT-E	
Petering capacity	wodei			RAV-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E	
Power supply	Cooling capacity (kW)			5.3	7.1	10.0	12.5		
Cooling Power factor Power factor Power consumption(kW) 1.53 1.93 2.21 3.16 Power consumption(kW) 1.53 1.93 2.21 3.16 Power factor %) 97 98 97 98 97 98 Power consumption(kW) 1.53 1.93 2.21 3.16 Power factor %) 97 98 97 98 Power consumption(kW) 1.20 2.03 2.34 3.21 Power consumption(kW) 1.20 2.03 2.34 3.21 Power consumption(kW) 1.20 2.03 2.34 3.21 Power factor %) 97 98 97 98 Power factor %) 98 Power factor %) 97 98 97 98 Power factor %) 97 Power factor %) 97 98 Power factor %) 97 98 97 Power factor %) 97	Heating capacity (kW)				5.6 8.0 11.2 14.0				
Power factor	Power supply					1 phase 230V (2	20 – 240V) 50Hz		
Power factor (%) 97 98 97 98 97 98			Running curre	nt (A)	7.17 – 6.57	8.95 – 8.21	10.36 – 9.49	14.66 – 13.44	
Cooling EER 3.46 3.68 4.52 3.96			Power consum	nption(kW)	1.53	1.93	2.21	3.16	
EBECTICAL Energy efficiency class * A A A A A A A A A A A A A A A A A A		Cooling	Power factor	(%)	97	98	97	98	
Electrical characteristics		Cooling	EER		3.46	3.68	4.52	3.96	
Electrical characteristics			Energy efficier	ncy class *	Α	Α	Α	А	
Characteristics of the content of the con			Energy rating	**	_	_	_	_	
Heating			Running curre	nt (A)	5.62 – 5.15	9.42 – 8.63	10.96 – 10.05	14.89 – 13.65	
Heating Flating Fla			Power consum	nption(kW)	1.20	2.03	2.34	3.21	
COP 4.67 3.94 4.79 4.36 Energy efficiency class A		Lloating	Power factor	(%)	97	98	97	98	
Maximum current		nealing	COP		4.67	3.94	4.79	4.36	
Maximum current			Energy efficier	ncy class *	Α	Α	Α	А	
Main unit			Energy rating	**	_	_	_	_	
Appearance Ceiling panel (Sold separately) Fanel color W: Moon-white (2.5GY 9.0/0.5), WS: Stripe-white (2.5GY 9.0/0.5) (Gray: 8B 3/0.3))		Maximum current			15.33	15.33	20.50	20.50	
Panel color W: Moon-white (2.5GY 9.0/0.5), WS: Stripe-white (2.5GY 9.0/0.5, (Gray: 8B 3/0.3))		Main unit			Zinc hot dipping steel plate				
Outer dimension Height (mm) 256 256 319 319 Cuter dimension Width (mm) 840 840 840 840 Ceiling panel (Sold separately) Height (mm) 30 30 30 30 Ceiling panel (Sold separately) Width (mm) 950 950 950 950 Depth (mm) 950 950 950 950 950 Total weight Main unit (kg) 20 20 24 24 Ceiling panel (Sold separately) (kg) 4.2 4.2 4.2 4.2 Heat texchanger Fan Turbo fan<	Appearance	Ceiling panel	Model		RBC-U31PG (W)-E, RBC-U31PG (WS)-E				
Outer dimension Main unit Width (mm) 840 840 840 840 Ceiling panel (Sold separately) Height (mm) 30 30 30 30 Ceiling panel (Sold separately) Width (mm) 950 950 950 950 Depth (mm) 950 950 950 950 950 Total weight Main unit (kg) 20 20 24 24 Ceiling panel (Sold separately) (kg) 4.2 4.2 4.2 4.2 Heat exchanger Fan Turbo fan		(Sold separately)	Panel color		W: Moon-white (2.5GY 9.0/0.5), WS: Stripe-white (2.5GY 9.0/0.5, (Gray: 8B 3/0.3))				
Outer dimension Depth (mm) 840 840 840 840 Ceiling panel (Sold separately) Width (mm) 30 30 30 30 Total weight Main unit (kg) 20 20 24 24 Ceiling panel (Sold separately) (kg) 20 20 24 24 Heat exchanger Fan Turbo fan T		Main unit	Height	(mm)	256	256	319	319	
Ceiling panel (Sold separately) Height (mm) 30 30 30 30 30 30 30 3			Width	(mm)	840	840	840	840	
Ceiling panel (Sold separately) Width (mm) 950	Outer		Depth	(mm)	840	840	840	840	
Cold separately Cold separately Depth (mm) 950	dimension		Height	(mm)	30	30	30	30	
Depth (mm) 950 950 950 950 950 950 Pota			Width	(mm)	950	950	950	950	
Total weight Ceiling panel (Sold separately) (kg) 4.2 <th colsp<="" td=""><td></td><td></td><td>Depth</td><td>(mm)</td><td>950</td><td>950</td><td>950</td><td>950</td></th>	<td></td> <td></td> <td>Depth</td> <td>(mm)</td> <td>950</td> <td>950</td> <td>950</td> <td>950</td>			Depth	(mm)	950	950	950	950
Ceiling panel (Sold separately) (kg) 4.2	Total weight	Main unit		(kg)	20	20	24	24	
Fan unit Fan Turbo fan Turbo fan Turbo fan Turbo fan Turbo fan Turbo fan	iotai weigiti	Ceiling panel (Solo	d separately)	(kg)	4.2	4.2	4.2	4.2	
Fan unit Standard air flow Motor H/M/L (m³/min.) 17.5/14.5/13.0 20.5/16.0/13.5 33.5/24.0/19.5 35.0/24.0/20.5 Air filter Standard filter attached (Long life filter) Controller (Sold separately) RBC-AMT32E, AS21E2, AX31U (W)-E Sound pressure level H/M/L (dB•A) 32/29/28 35/31/28 43/38/33 44/38/34 Sound power level H/M/L (dB•A) 47/44/43 50/46/43 58/53/48 59/53/49 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5	Heat exchanger					Finne	d tube		
Motor (W) 14 20 68 72 Air filter Standard filter attached (Long life filter) Controller (Sold separately) RBC-AMT32E, AS21E2, AX31U (W)-E Sound pressure level H/M/L (dB•A) 32/29/28 35/31/28 43/38/33 44/38/34 Sound power level H/M/L (dB•A) 47/44/43 50/46/43 58/53/48 59/53/49 Gas side (mm) 12.7 15.9 15.9 15.9 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5		Fan			Turbo fan	Turbo fan	Turbo fan	Turbo fan	
Standard filter attached (Long life filter) Controller (Sold separately) RBC-AMT32E, AS21E2, AX31U (W)-E Sound pressure level H/M/L (dB•A) 32/29/28 35/31/28 43/38/33 44/38/34 Sound power level H/M/L (dB•A) 47/44/43 50/46/43 58/53/48 59/53/49 Gas side (mm) 12.7 15.9 15.9 15.9 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5	Fan unit	Standard air flow	H/M/L	(m³/min.)	17.5/14.5/13.0	20.5/16.0/13.5	33.5/24.0/19.5	35.0/24.0/20.5	
Controller (Sold separately) RBC-AMT32E, AS21E2, AX31U (W)-E Sound pressure level H/M/L (dB•A) 32 / 29 / 28 35 / 31 / 28 43 / 38 / 33 44 / 38 / 34 Sound power level H/M/L (dB•A) 47 / 44 / 43 50 / 46 / 43 58 / 53 / 48 59 / 53 / 49 Gas side (mm) 12.7 15.9 15.9 15.9 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5		Motor		(W)	14	20	68	72	
Sound pressure level H/M/L (dB•A) 32/29/28 35/31/28 43/38/33 44/38/34 Sound power level H/M/L (dB•A) 47/44/43 50/46/43 58/53/48 59/53/49 Gas side (mm) 12.7 15.9 15.9 15.9 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5	Air filter					Standard filter attac	ched (Long life filter)		
Sound power level H/M/L (dB•A) 47/44/43 50/46/43 58/53/48 59/53/49 Gas side (mm) 12.7 15.9 15.9 15.9 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5	Controller (Sold	separately)				RBC-AMT32E, AS2	21E2, AX31U (W)-E		
Gas side (mm) 12.7 15.9 15.9 15.9 Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5	Sound pressure	level	H/M/L	(dB•A)	32 / 29 / 28	35 / 31 / 28	43 / 38 / 33	44 / 38 / 34	
Connecting pipe Liquid side (mm) 6.4 9.5 9.5 9.5	Sound power le	Sound power level H/M/L (dB•A)		(dB•A)	47 / 44 / 43	50 / 46 / 43	58 / 53 / 48	59 / 53 / 49	
			Gas side	(mm)	12.7	15.9	15.9	15.9	
Drain port (mm) VP25	Connecting pipe	9	Liquid side	(mm)	6.4	9.5	9.5	9.5	
l I			Drain port	(mm)		VF	225		

*: IEC standard, **: AS standard

Madal	Indoor unit		RAV-	SM564UT-E	SM804UT-E	SM1104UT-E	SM1404UT-E	
Model	Outdoor unit		RAV-	SM563AT-E	SM803AT-E	SM1103AT-E	SM1403AT-E	
Cooling capacity (Fig. 1)			(kW)	5.3	6.7	10.0	12.0	
Heating capacity			(kW)	5.6	8.0	11.2	14.0	
Power supply					1 phase 230V (2	20 – 240V) 50Hz		
		Running current	(A)	7.89 – 7.24	9.97 – 9.12	14.61 – 13.40	17.62 – 16.14	
		Power consump	tion(kW)	1.65	2.09	3.11	3.74	
	O a a line a	Power factor	(%)	95	95	97	96	
	Cooling	EER		3.21	3.21	3.22	3.21	
		Energy efficienc	y class *	А	А	А	А	
		Energy rating **	:	_	_	_	_	
Electrical characteristics		Running current	(A)	6.89 – 6.32	10.83 – 9.90	13.38 – 12.38	17.88 – 15.87	
onaraotonouso		Power consump	tion(kW)	1.44	2.21	2.93	3.80	
	l la ation	Power factor	(%)	95	93	99	98	
	Heating	COP		3.89	3.62	3.82	3.68	
		Energy efficienc	y class *	Α	Α	Α	А	
		Energy rating **	:	_	_	_	_	
	Maximum current			15.33	15.33	20.50	20.50	
	Main unit			Zinc hot dipping steel plate				
Appearance	Ceiling panel Model			RBC-U31PG (W)-E, RBC-U31PG (WS)-E				
	(Sold separately)	Panel color		W: Moon-white (2.5GY 9.0/0.5), WS: Stripe-white (2.5GY 9.0/0.5, (Gray: 8B 3/0.3))				
		Height	(mm)	256	256	319	319	
	Main unit	Width	(mm)	840	840	840	840	
Outer		Depth	(mm)	840	840	840	840	
dimension		Height	(mm)	30	30	30	30	
	Ceiling panel (Sold separately)	Width	(mm)	950	950	950	950	
	, , , , , , , , , , , , , , , , , , , ,	Depth	(mm)	950	950	950	950	
Total weight	Main unit		(kg)	24	24	24	24	
rotal weight	Ceiling panel (Solo	d separately)	(kg)	4.2	4.2	4.2	4.2	
Heat exchange					Finne	d tube		
	Fan			Turbo fan	Turbo fan	Turbo fan	Turbo fan	
Fan unit	Standard air flow	H/M/L	(m³/min.)	17.5/14.5/13.0	20.5/16.0/13.5	33.5/24.0/19.5	35.0/24.0/20.5	
	Motor		(W)	14	20	68	72	
Air filter					Standard filter attac	ched (Long life filter)		
Controller (Sold	separately)				RBC-AMT32E, AS2	21E2, AX31U (W)-E		
Sound pressure	e level	H/M/L	(dB•A)	32 / 29 / 28	35 / 31 / 28	43 / 38 / 33	44 / 38 / 34	
Sound power le	vel	H/M/L	(dB•A)	47 / 44 / 43	50 / 46 / 43	58 / 53 / 48	59 / 53 / 49	
		Gas side	(mm)	12.7	15.9	15.9	15.9	
Connecting pipe	Э	Liquid side	(mm)	6.4	9.5	9.5	9.5	
Drain port		(mm)	VP25					

*: IEC standard, **: AS standard

<Twin type>

	Indoor unit 1		RAV-	SM564UT-E	SM804UT-E	
Model	Indoor unit 2		RAV-	SM564UT-E	SM804UT-E	
Outdoor unit			RAV-	SP1104AT(Z)(ZG)-E	SP1404AT(Z)(ZG)-E	
Cooling capacity (kW)				10.0	12.5	
Heating capaci	ty		(kW)	11.2	14.0	
			Indoor unit			
Power supply				1 phase 230V (2	20 – 240V) 50Hz	
		Running current	(A)	10.36 – 9.49	14.66 – 13.44	
		Power consumption	(kW)	2.21	3.16	
	Cooling	Power factor	(%)	97	98	
		EER		4.52	3.96	
Electrical		Energy efficiency class	S *	A	A	
characteristics		Running current	(A)	10.96 – 10.05	14.89 – 13.65	
		Power consumption	(kW)	2.34	3.21	
	Heating	Power factor	(%)	97	98	
		COP	(**/	4.79	4.36	
		Energy efficiency class	S *	A	A	
	Fan			Turbo fan	Turbo fan	
Fan unit			(m³/min.)	17.5 / 14.5 / 13.0	20.5 / 16.0 / 13.5	
	Motor (W)			14	20	
Sound pressure		H/M/L	(dB•A)	32 / 29 / 28	35 / 31 / 28	
Sound power le		H/M/L	(dB•A)	47 / 44 / 43	50 / 46 / 43	
- Courta power to		177772	Outdoor unit		007 407 40	
Power supply			Outdoor unit	1 phase 230V (220 – 240V) 50Hz		
1 ower suppry	Standard length		(m)	7.5	7.5	
	Min. length		(m)	3	3	
	Max. total length		(m)	50	50	
Outer dimension	Over 30m		(111)	40g/m (31m to 50m)	40g/m (31m to 50m)	
		Outdoor lower	(m)	30	30	
	Height difference	Outdoor higher	(m)	30	30	
	Fan	Outdoor Higher	(111)	Propeller fan	Propeller fan	
Fan unit		volume	(m³/min.)	101	103	
i aii uiii	Standard air flow volume (m³/min.) Motor (W)			100 + 100	100 + 100	
	Wiotoi	Main	(mm)	15.9	15.9	
	Gas side	Sub	(mm)	12.7	15.9	
Connecting pipe		Main	. ,	9.5	9.5	
	Liquid side		(mm)			
Counties		Sub	(mm)	6.4	9.5	
Sound pressure level Cooling/Heating		(dB•A)	49 / 50	51 / 52		
Sound power le	evel	Cooling/Heating	(dB•A)	66 / 67	68 / 69	

*: IEC standard

	Indoor unit 1		RAV-	SM564UT-E	SM804UT-E	
Model	Indoor unit 2		RAV-	SM564UT-E	SM804UT-E	
Outdoor unit			RAV-	SM1103AT-E	SM1403AT-E	
Cooling capacit	ty		(kW)	10.0	12.5	
Heating capaci	ty		(kW)	11.2	14.0	
			Indoor unit			
Power supply				1 phase 230V (2	220 – 240V) 50Hz	
		Running current	(A)	14.40 – 13.20	20.57 – 18.97	
		Power consumption	(kW)	3.11	4.09	
	Cooling	Power factor	(%)	98	95	
		EER		3.22	3.06	
Electrical		Energy efficiency class	3 *	A	В	
characteristics		Running current	(A)	14.40 – 13.20	17.74– 16.08	
		Power consumption	(kW)	2.93	4.00	
	Heating	Power factor	(%)	98	99	
		COP		3.82	3.50	
		Energy efficiency class	S *	A	В	
	Fan			Turbo fan	Turbo fan	
Fan unit	Standard air flow	H/M/L	(m³/min.)	17.5 / 14.5 / 13.0	20.5 / 16.0 / 13.5	
	Motor (W)			14	20	
Sound pressure	e level	H/M/L	(dB•A)	32 / 29 / 28	35 / 31 / 28	
Sound power le	evel	H/M/L	(dB•A)	47 / 44 / 43	50 / 46 / 43	
			Outdoor unit	<u> </u>		
Power supply				1 phase 230V (220 – 240V) 50Hz		
	Standard length		(m)	7.5	7.5	
	Min. length		(m)	5	5	
Outer	Max. total length		(m)	50	50	
dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)	
	Height	Outdoor lower	(m)	30	30	
	difference	Outdoor higher	(m)	30	30	
	Fan			Propeller fan	Propeller fan	
Fan unit	Standard air flow	volume	(m³/min.)	75	75	
	Motor		(W)	63	100	
		Main	(mm)	15.9	15.9	
Connecting	Gas side	Sub	(mm)	12.7	15.9	
pipe		Main	(mm)	9.5	9.5	
	Liquid side	Sub	(mm)	6.4	9.5	
Sound pressure	e level	Cooling/Heating	(dB•A)	53 / 54	54 / 54	
Sound power le	evel	Cooling/Heating	(dB•A)	70 / 71	71 / 71	

*: IEC standard

1-1-2. Concealed Duct Type

<Single type>

Model	Indoor unit		RAV-SM	562BT-E	802BT-E	1102BT-E	1402BT-E	
Wiodei	Outdoor unit		RAV-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E	
Cooling capacity	Cooling capacity (kW)			5.0	7.1	10.0	12.5	
Heating capacit	у		(kW)	5.6	8.0	11.2	14.0	
Power supply					1 phase 230V (2	20 – 240V) 50Hz		
		Running currer	it (A)	6.51 – 5.97	9.74 – 8.93	13.78 – 12.63	17.76 – 16.28	
		Power consump	otion(kW)	1.39	2.10	2.94	3.83	
	Cooling	Power factor	(%)	97	98	97	98	
	Cooling	EER		3.60	3.38	3.40	3.26	
		Energy efficien	cy class *	А	А	А	А	
		Energy rating *	*	_	_	_	_	
Electrical characteristics		Running currer	it (A)	7.26 – 6.66	9.74 – 8.93	12.98 – 11.90	15.82 – 14.50	
0.10.100101.01.00		Power consump	otion(kW)	1.55	2.41	2.77	3.41	
		Power factor	(%)	97	94	97	98	
	Heating	COP		3.61	3.32	4.04	4.11	
		Energy efficien	cy class *	А	Α	А	А	
		Energy rating *	*	_	_	_	_	
	Maximum current			15.86	16.30	21.73	22.13	
	Main unit			Zinc hot dipping steel plate				
Appearance	Ceiling panel	Model		_				
	(Sold separately)	Panel color		_				
		Height	(mm)	320	320	320	320	
	Main unit	Width	(mm)	700	1000	1350	1350	
Outer		Depth	(mm)	800	800	800	800	
dimension		Height	(mm)	_	_	_	_	
	Ceiling panel (Sold separately)	Width	(mm)	_	_	_	_	
		Depth	(mm)	_	_	_	_	
Total weight	Main unit		(kg)	30	39	54	54	
Total Weight	Ceiling panel (Solo	d separately)	(kg)	_	_	_	_	
Heat exchanger					Finne	d tube		
	Fan			Centrifugal	Centrifugal	Centrifugal	Centrifugal	
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0/11.9/9.8	19.0/16.2/13.3	27.0/23.0/18.9	33.0/28.0/23.1	
	Motor		(W)	120	120	120	120	
Air filter TCB-			UFM21BE UFM61BE	UFM11BFCE UFM31BE UFM51BFCE UFM71BE	UFM- UFM6 ⁻	1BFCE 41BE 1BFCE 81BE		
Controller (Sold separately)				RBC-AMT31E, AS2	21E2, AX21U(W)-E2	!		
Sound pressure	Sound pressure level H/M/L (dB•A)		40 / 37 / 33	40 / 37 / 34	42 / 39 / 36	44 / 41 / 38		
Sound power le	vel	H/M/L	(dB•A)	55 / 52 / 48	55 / 52 / 49	57 / 54 / 51	59 / 56 / 53	
		Gas side	(mm)	12.7	15.9	15.9	15.9	
Connecting pipe	9	Liquid side	(mm)	6.4	9.5	9.5	9.5	
		Drain port	(mm)		VF	P25	1	

*: IEC standard, **: AS standard

<Twin type>

	Indoor unit 1		RAV-	SM562BT-E	SM802BT-E	
Model	Indoor unit 2		RAV-	SM562BT-E	SM802BT-E	
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E	SP1404AT(Z)(ZG)-E	
Cooling capacit	ty		(kW)	10.0	12.5	
Heating capacit	ty		(kW)	11.2	14.0	
			Indoor unit			
Power supply				1 phase 230V (2	20 – 240V) 50Hz	
		Running current	(A)	13.78 – 12.63	17.76 – 16.28	
		Power consumption	(kW)	2.94	3.83	
	Cooling	Power factor	(%)	97	98	
		EER		3.4	3.26	
Electrical		Energy efficiency class	S *	А	A	
characteristics		Running current	(A)	12.98 – 11.90	15.82 – 14.50	
		Power consumption	(kW)	2.77	3.41	
	Heating	Power factor	(%)	97	98	
		COP		4.04	4.11	
		Energy efficiency class	S *	Α	A	
	Fan			Centrifugal	Centrifugal	
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.9 / 9.8	19.0 / 16.2 / 13.3	
	Motor (W)			120	120	
Sound pressure	e level	H/M/L	(dB•A)	40 / 37 / 33	40 / 37 / 34	
Sound power le		H/M/L	(dB•A)	55 / 52 / 48	55 / 52 / 49	
·			Outdoor unit			
Power supply				1 phase 230V (220 – 240V) 50Hz		
	Standard length		(m)	7.5	7.5	
	Min. length		(m)	3	3	
Outer	Max. total length		(m)	50	50	
dimension	Over 30m		, ,	40g/m (31m to 50m)	40g/m (31m to 50m)	
	Height	Outdoor lower	(m)	30	30	
	difference	Outdoor higher	(m)	30	30	
	Fan	-		Propeller fan	Propeller fan	
Fan unit	Standard air flow	volume	(m³/min.)	101	103	
	Motor		(W)	100 + 100	100 + 100	
		Main	(mm)	15.9	15.9	
Connecting	Gas side	Sub	(mm)	12.7	15.9	
pipe		Main	(mm)	9.5	9.5	
	Liquid side	Sub	(mm)	6.4	9.5	
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52	
Sound power le		Cooling/Heating	(dB•A)	66 / 67	68 / 69	

*: IEC standard

1-1-3. Under Ceiling Type

<Single type>

Model	Indoor unit		RAV-SM	562CT-E	802CT-E	1102CT-E	1402CT-E	
Model	Outdoor unit		RAV-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E	
Cooling capacity	Cooling capacity (kW)			5.0	7.1	10.0	12.5	
Heating capacity	у		(kW)	5.6	5.6 8.0 11.2 14.0			
Power supply					1 phase 230V (2	20 – 240V) 50Hz		
		Running currer	nt (A)	6.61 - 6.06	9.47 – 8.93	12.51 – 11.47	17.30 – 15.86	
		Power consum	ption(kW)	1.41	2.1	2.67	3.73	
	Cooling	Power factor	(%)	97	98	97	98	
	Cooling	EER		3.55	3.38	3.75	3.35	
		Energy efficien	cy class *	Α	Α	Α	Α	
		Energy rating a	ic alje					
Electrical characteristics		Running currer	nt (A)	7.03 – 6.44	10.20 - 9.35	12.28 – 11.25	16.93 – 15.52	
		Power consum	ption(kW)	1.50	2.20	2.62	3.65	
	Heating	Power factor	(%)	97	98	97	98	
	пеаші	COP		3.73	3.64	4.27	3.84	
		Energy efficien	cy class *	Α	Α	Α	А	
		Energy rating *	**	_	_	_	_	
	Maximum current			15.48	15.90	21.35	21.35	
	Main unit			Shine white				
Appearance	Ceiling panel	Model						
	(Sold separately)	Panel color		_				
		Height	(mm)	210	210	210	210	
	Main unit	Width	(mm)	910	1180	1595	1595	
Outer		Depth	(mm)	680	680	680	680	
dimension		Height	(mm)	_	_	_	ı	
	Ceiling panel (Sold separately)	Width	(mm)	_	_	_	_	
	, , ,	Depth	(mm)	_	_	_	_	
Total weight	Main unit		(kg)	21	25	33	33	
iotai weigiti	Ceiling panel (Solo	d separately)	(kg)	_	_	_	_	
Heat exchanger					Finne	d tube		
	Fan			Centrifugal	Centrifugal	Centrifugal	Centrifugal	
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0/11.2/10.0	18.5/16.7/14.6	27.5/24.0/21.2	30.0/26.0/23.1	
	Motor		(W)	60	60	120	120	
Air filter	Air filter				Attached	main unit		
Controller (Sold	separately)			RBC-AM	MT31E, AS21E2, TC	CB-SC642TLE2, AX	21UCE2	
Sound pressure	Sound pressure level H/M/L ((dB•A)	36 / 33 / 30	38 / 36 / 33	41 / 38 / 36	43 / 40 / 37	
Sound power lev	vel	H/M/L	(dB•A)	51 / 48 / 45	53 / 51 / 48	56 / 53 / 50	58 / 55 / 52	
		Gas side	(mm)	12.7	15.9	15.9	15.9	
Connecting pipe	e	Liquid side	(mm)	6.4	9.5	9.5	9.5	
<u> </u>		Drain port	(mm)		VF	25		

*: IEC standard, **: AS standard

<Twin type>

	Indoor unit 1		RAV-	SM562CT-E	SM802CT-E
Model	Indoor unit 2		RAV-	SM562CT-E	SM802CT-E
	Outdoor unit		RAV-	SP1104AT(Z)(ZG)-E	SP1404A(Z)(ZG)-E
Cooling capacit	У		(kW)	10.0	12.5
Heating capacit	ty		(kW)	11.2	14.0
			Indoor unit		
Power supply				1 phase 230V (2	20 – 240V) 50Hz
		Running current	(A)	12.51 – 11.47	17.30 – 15.86
		Power consumption	(kW)	2.67	3.73
	Cooling	Power factor	(%)	97	98
		EER		3.75	3.35
Electrical		Energy efficiency class	S *	A	A
characteristics		Running current	(A)	12.28 – 11.25	16.93 – 15.52
		Power consumption	(kW)	2.62	3.65
	Heating	Power factor	(%)	97	98
		COP		4.27	3.84
		Energy efficiency class	S *	Α	A
	Fan			Centrifugal	Centrifugal
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.0 / 11.2 / 10.0	18.5 / 16.7 / 14.6
	Motor (W)			60	60
Sound pressure	e level	H/M/L	(dB•A)	36 / 33 / 30	38 / 36 / 33
Sound power le	evel	H/M/L	(dB•A)	51 / 48 / 45	53 / 51 / 48
			Outdoor unit		
Power supply				1 phase 230V (2	20 – 240V) 50Hz
	Standard length		(m)	7.5	7.5
	Min. length		(m)	3	3
Outer	Max. total length		(m)	50	50
dimension	Over 30m		, ,	40g/m (31m to 50m)	40g/m (31m to 50m)
	Height	Outdoor lower	(m)	30	30
	difference	Outdoor higher	(m)	30	30
	Fan	-		Propeller fan	Propeller fan
Fan unit	Standard air flow	volume	(m³/min.)	101	103
	Motor		(W)	100 + 100	100 + 100
		Main	(mm)	15.9	15.9
Connecting	Gas side	Sub	(mm)	12.7	15.9
pipe		Main	(mm)	9.5	9.5
	Liquid side	Sub	(mm)	6.4	9.5
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52
Sound power le		Cooling/Heating	(dB•A)	66 / 67	68 / 69

*: IEC standard

1-1-4. High Wall Type

<Single type>

	Indoor unit	RAV-	SM562KRT-E	SM802KRT-E	
Model	Outdoor unit	RAV-	SP562AT(Z)(ZG)-E	SP802AT(Z)(ZG)-E	
Cooling capacit	Cooling capacity (kW)		5.0	6.9	
Heating capacit	у	(kW)	5.6	8.0	
Power supply			1 phase 230V (2	20 – 240V) 50Hz	
		Running current (A)	8.33 – 7.63	13.15 – 12.05	
		Power consumption(kW)	1.39	2.4	
	O a a line a	Power factor (%)	95	94	
	Cooling	EER	3.60	2.88	
		Energy efficiency class *	А	С	
		Energy rating **	_	_	
Electrical characteristics		Running current (A)	8.14 – 7.46	12.91 – 11.84	
0114140101101100		Power consumption(kW)	1.55	2.4	
		Power factor (%)	95	94	
	Heating	COP	3.61	3.33	
		Energy efficiency class *	А	С	
		Energy rating **	_	_	
	Maximum current		15.34	15.47	
	Main unit		Pure white		
Appearance	Ceiling panel	Model	-	_	
	(Sold separately)	Panel color	-	_	
		Height (mm)	298	298	
	Main unit	Width (mm)	998	998	
Outer		Depth (mm)	221	221	
dimension		Height (mm)	_	_	
	Ceiling panel (Sold separately)	Width (mm)	_	_	
	(Sold Sopulatoly)	Depth (mm)	_	_	
+	Main unit	(kg)	12	12	
Total weight	Ceiling panel (Solo	d separately) (kg)	_	_	
Heat exchange	•		Finne	d tube	
	Fan		Cross flow fan	Cross flow fan	
Fan unit	Standard air flow	H/M/L (m³/min.)	14.0 / 12.5 / 10.7	18.5 / 14.6 / 12.2	
	Motor	(W)	30	30	
Air filter			Attached	main unit	
Controller (Sold	separately)		RBC-AMT31E, AS21E2, TC (FCU comes w	CB-SC642TLE2, AX21UCE2 vith WH-H2UE)	
Sound pressure	e level	H/M/L (dB•A)	39 / 36 / 33	45 / 41 / 36	
Sound power le	vel	H/M/L (dB•A)	54 / 51 / 48	60 / 56 / 51	
		Gas side (mm)	12.7	15.9	
Connecting pipe	Э	Liquid side (mm)	6.4	9.5	
		Drain port (mm)	VP	216	

*: IEC standard, **: AS standard

<Twin type>

	Indoor unit 1		RAV-	SM562KRT-E	SM802KRT-E	
Model	Indoor unit 2 Outdoor unit		RAV-	SM562KRT-E	SM802KRT-E	
			RAV-	SP1104AT(Z)(ZG)-E	SP1404AT(Z)(ZG)-E	
Cooling capacit	ty		(kW)	10.0	12.3	
Heating capacit	ty		(kW)	11.2	14.0	
			Indoor unit			
Power supply				1 phase 230V (2	20 – 240V) 50Hz	
	Running current		(A)	12.98 – 11.90	18.00 – 16.50	
		Power consumption	(kW)	2.77	3.88	
	Cooling	Power factor	(%)	97	98	
		EER		3.61	3.17	
Electrical		Energy efficiency class	S *	A	В	
characteristics		Running current	(A)	13.12 – 12.03	17.76 – 16.28	
		Power consumption	(kW)	2.80	3.83	
	Heating	Power factor	(%)	97	98	
		COP	, ,	4.00	3.66	
		Energy efficiency class	S *	A	A	
	Fan			Cross flow fan	Cross flow fan	
Fan unit	Standard air flow	H/M/L	(m³/min.)	14.0 / 12.5 / 10.7	18.5 / 14.6 / 12.2	
	Motor (W)			30	30	
Sound pressure	e level	H/M/L	(dB•A)	39 / 36 / 33	45 / 41 / 36	
Sound power le		H/M/L	(dB•A)	54 / 51 / 48	60 / 56 / 51	
· ·			Outdoor unit			
Power supply				1 phase 230V (220 – 240V) 50Hz		
	Standard length		(m)	7.5	7.5	
	Min. length		(m)	3	3	
Outer	Max. total length		(m)	50	50	
dimension	Over 30m			40g/m (31m to 50m)	40g/m (31m to 50m)	
	Height	Outdoor lower	(m)	30	30	
	difference	Outdoor higher	(m)	30	30	
	Fan	I		Propeller fan	Propeller fan	
Fan unit	Standard air flow	volume	(m³/min.)	101	103	
	Motor		(W)	100 + 100	100 + 100	
		Main	(mm)	15.9	15.9	
Connecting	Gas side	Sub	(mm)	12.7	15.9	
pipe		Main	(mm)	9.5	9.5	
	Liquid side	Sub	(mm)	6.4	9.5	
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50	51 / 52	
Sound power le		Cooling/Heating	(dB•A)	66 / 67	68 / 69	

1-1-5. Compact 4-Way Cassette (600×600) Type

<Single type>

	Indoor unit		RAV-SM562MUT-E
Model	Outdoor unit		RAV-SP562AT(Z)(ZG)-E
Cooling capacity	poling capacity (kW)		5.0
Heating capacit	у	(kW)	5.6
Power supply			1 phase 230V
		Running current (A)	6.6 – 7.15
		Power consumption(kW)	1.53
	O a a line a	Power factor (%)	97
	Cooling	EER	3.27
		Energy efficiency class	A
		Energy rating	4.5
Electrical characteristics		Running current (A)	6.62 – 7.21
0.10.00101101100		Power consumption(kW)	1.54
	I I a a Norma	Power factor (%)	97
	Heating	COP	3.64
		Energy efficiency class	A
		Energy rating	4.5
	Maximum current		15.53
	Main unit		Zinc hot dipping steel plate
Appearance	Ceiling panel	Model	RBC-UM11PG(W)-E
	(Sold separately)	Panel color	Moon-white (Muncel 2.5GY 9.0 / 0.5)
		Height (mm)	268
	Main unit	Width (mm)	575
Outer		Depth (mm)	575
dimension		Height (mm)	27
	Ceiling panel (Sold separately)	Width (mm)	700
	, , , , , , , , , , , , , , , , , , , ,	Depth (mm)	700
Total weight	Main unit	(kg)	17
Total Weight	Ceiling panel (Solo	d separately) (kg)	3
Heat exchanger	r		Finned tube
	Fan		Turbo fan
Fan unit	Standard air flow	H/M/L (m³/min.)	13.3 / 11.2 / 9.1
	Motor	(W)	60
Air filter	Air filter		_
Controller (Sold	separately)		As per enclosure
Sound pressure	Sound pressure level H/M/L (dB•A)		43 / 39 / 34
Sound power le	vel	H/M/L (dB•A)	58 / 54 / 49
		Gas side (mm)	12.7
Connecting pipe	е	Liquid side (mm)	6.4
		Drain port (mm)	VP25

<Twin type>

	Indoor unit 1		RAV-	SM562MUT-E
Model	Indoor unit 2		RAV-	SM562MUT-E
	Outdoor unit		RAV-	SP1104(Z)(ZG)-E
Cooling capacit	y		(kW)	10.0
Heating capacit	ty		(kW)	11.2
			Indoor unit	
Power supply				1 phase 230V (220 – 240V) 50Hz
		Running current	(A)	12.51 – 11.47
		Power consumption	(kW)	2.67
	Cooling	Power factor	(%)	97
		EER		3.75
Electrical		Energy efficiency class	3 *	А
characteristics		Running current	(A)	12.51 – 11.47
		Power consumption	(kW)	2.67
	Heating	Power factor	(%)	97
		COP		4.19
		Energy efficiency class	S *	А
	Fan	I		Turbo fan
Fan unit	Standard air flow	H/M/L	(m³/min.)	13.3 / 11.2 / 9.1
	Motor		(W)	60
Sound pressure	e level	H/M/L	(dB•A)	43 / 39 / 34
Sound power le	evel	H/M/L	(dB•A)	58 / 54 / 49
			Outdoor uni	t
Power supply				1 phase 230V (220 – 240V) 50Hz
	Standard length		(m)	7.5
	Min. length		(m)	3
Outer	Max. total length		(m)	50
dimension	Over 30m			40g/m (31m to 50m)
	Height	Outdoor lower	(m)	30
	difference	Outdoor higher	(m)	30
	Fan			Propeller fan
Fan unit	Standard air flow	volume	(m³/min.)	101
	Motor		(W)	100 + 100
	Coopeids	Main	(mm)	15.9
Connecting	Gas side	Sub	(mm)	12.7
pipe	Liquid oids	Main	(mm)	9.5
	Liquid side	Sub	(mm)	6.4
Sound pressure	e level	Cooling/Heating	(dB•A)	49 / 50
Sound power le	evel	Cooling/Heating	(dB•A)	66 / 67

1-2. Outdoor Unit

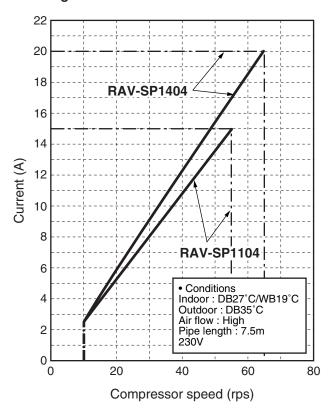
<Super Digital Inverter>

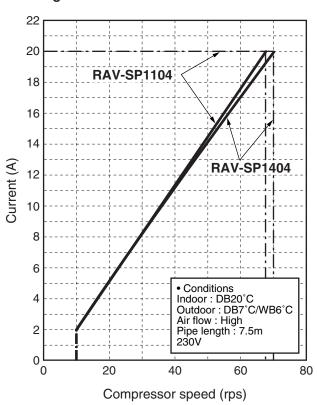
Model name	Outdoor u	nit	RAV-SP	562AT(Z)(ZG)-E	802AT(Z)(ZG)-E	1104AT(Z)(ZG)-E	1404AT(Z)(ZG)-E
Power supply				1 phase 230V (220 – 240V) 50Hz (Power exclusive to outdoor is required.)			
	Туре				Hermetic o	compressor	
Compressor	Motor		(kW)	2	2	3.75	3.75
	Pole			4	4	4	4
Refrigerant charge	ed		(kg)	1.5	2.1	3.1	3.1
Refrigerant contro	ıl				Pulse mo	otor valve	
	Standard le	ength	(m)	7.5	7.5	7.5	7.5
	Max. total I	ength	(m)	50	50	75	75
Inter connecting pipe		refrigerant charge piping connector		20g/m (21m to 50m)	40g/m (31m to 50m)	40g/m (31m to 75m)	40g/m (31m to 75m)
	Height	Outdoor lower	(m)	30	30	30	30
	difference	Outdoor higher	(m)	30	30	30	30
	Height		(mm)	795	795	1340	1340
Outer dimension	Width		(mm)	900	900	900	900
	Depth		(mm)	320	320	320	320
Appearance				Silky shade (Muncel 1Y8.5/0.5)			
Total weight			(kg)	55	62	93	93
Heat exchanger				Finned tube			
	Fan			Propeller fan			
Fan unit	Standard a	ir flow	(m³/h)	57	57	101	103
	Motor		(W)	63	63	100 + 100	100 + 100
0 " '	Gas side		(mm)	12.7	15.9	15.9	15.9
Connecting pipe	Liquid side		(mm)	6.4	9.5	9.5	9.5
Sound pressure le	evel	Cooling/Heating	(dB•A)	46 / 47	47 / 49	49 / 50	51 / 52
Sound power leve	I	Cooling/Heating	(dB•A)	63 / 64	64 / 66	66 / 67	68 / 69
Outside air tempe	rature, Coolir	ng	(°C)	43 to −15°C			
Outside air tempe	rature, Heati	ng	(°C)	15 to –15°C 15 to –20°C			С

1-3. Operation Characteristic Curve

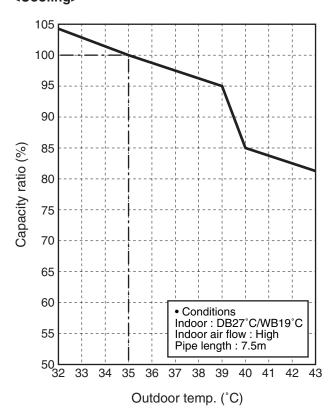
Operation characteristic curve <Super Digital Inverter>
 RAV-SP1104AT-E, SP1404AT-E / RAV-SP1104ATZ-E, SP1404ATZ-E / RAV-SP1104ATZG-E, SP1404ATZG-E

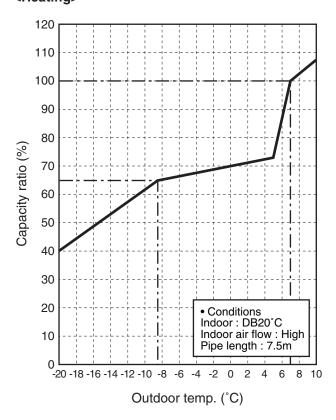
 < Heating>





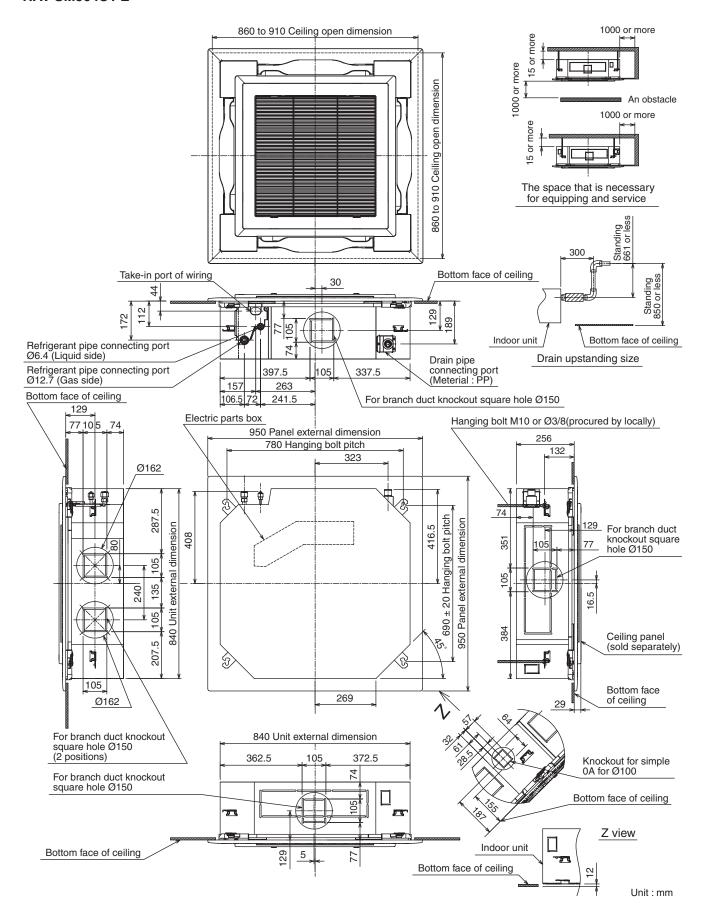
Capacity variation ratio according to temperature
 RAV-SP1104AT-E, SP1404AT-E / RAV-SP1104ATZ-E, SP1404ATZ-E / RAV-SP1104ATZG-E, SP1404ATZG-E
 <Cooling>



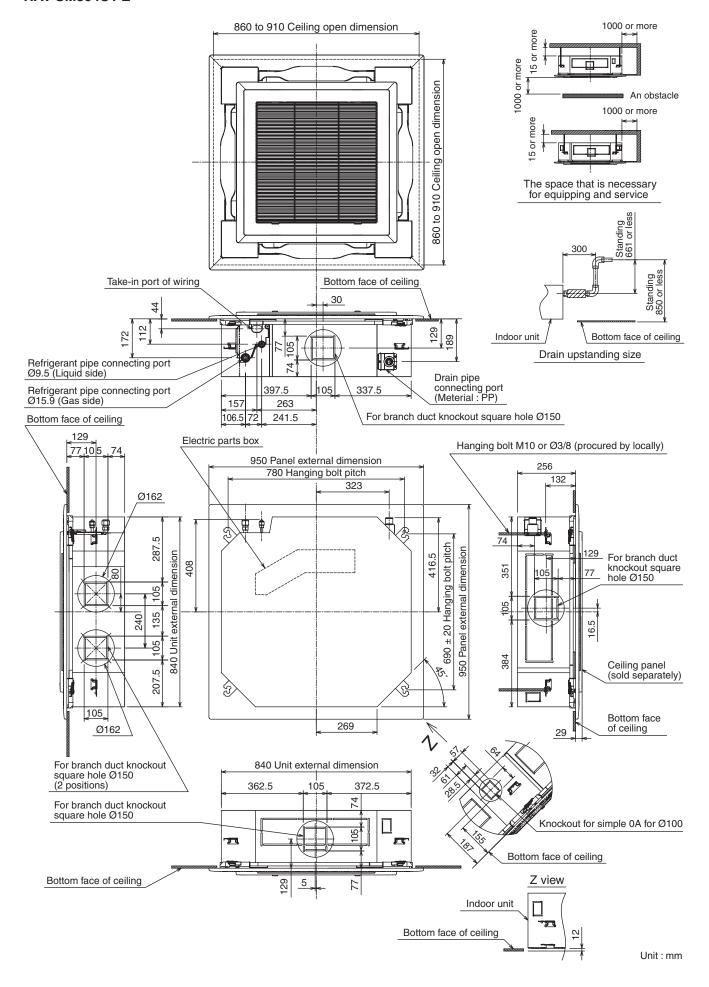


2. CONSTRUCTION VIEWS (EXTERNAL VIEWS)

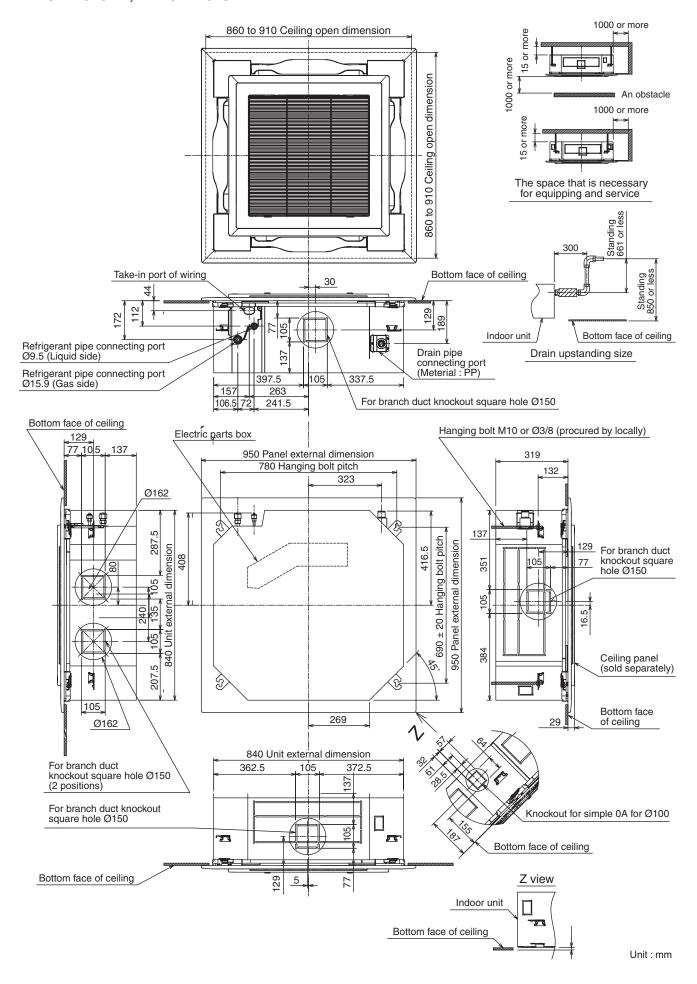
2-1. Indoor Unit RAV-SM564UT-E



RAV-SM804UT-E

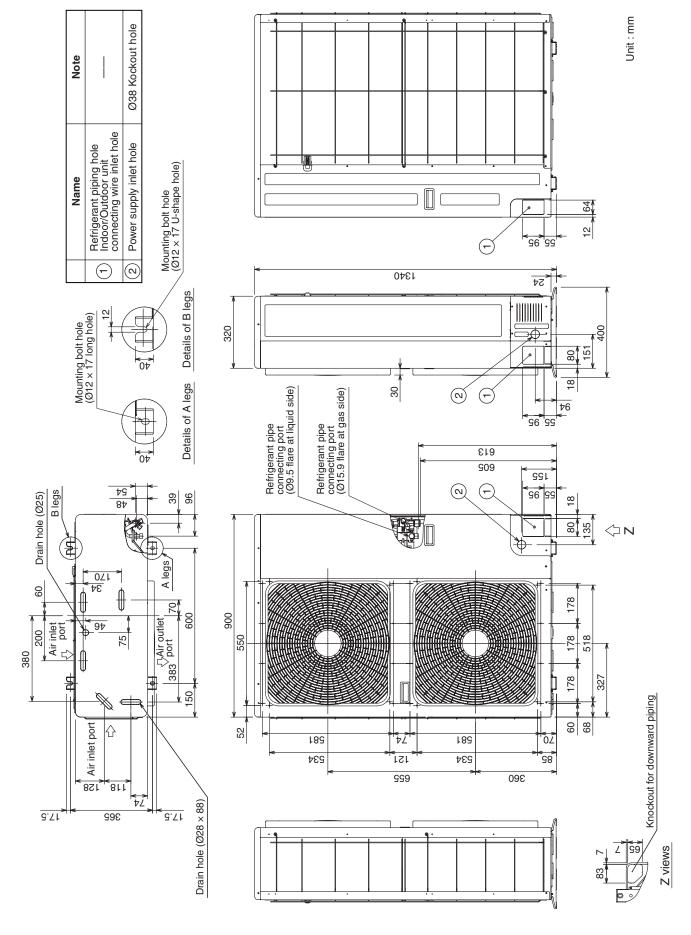


RAV-SM1104UT-E. RAV-SM1404UT-E

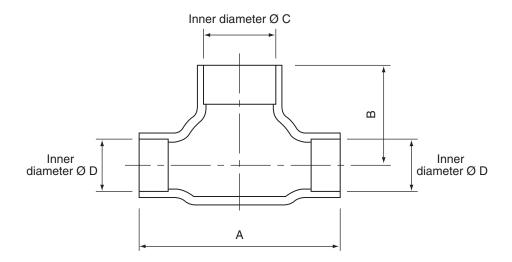


2-2. Outdoor Unit

RAV-SP1104AT-E, RAV-SP1404AT-E / RAV-SP1104ATZ-E, RAV-SP1404ATZ-E / RAV-SP1104ATZG-E, RAV-SP1404ATZG-E



RAV-TWP30E2, RAV-TWP50E2 (Simultaneous Twin)

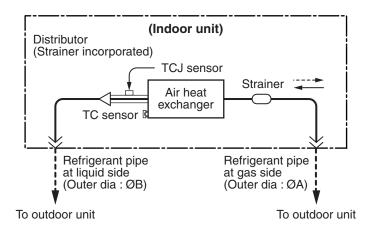


Model (RBC-)		Α	В	С	D
TWDOOFO	Liquid side	36	14	Ø9.5	Ø6.4
TWP30E2	Gas side	43	23	Ø15.9	Ø12.7
TWDEOEO	Liquid side	34	14	Ø9.5	Ø9.5
TWP50E2	Gas side	44	21	Ø15.9	Ø15.9

3. SYSTEMATIC REFRIGERATING CYCLE DIAGRAM

3-1. Indoor Unit

• Single type (Combination of 1 indoor unit and 1 outdoor unit)



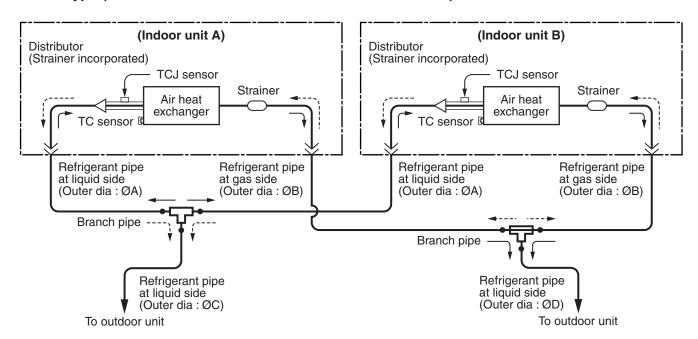
Dimension table

Indoor unit	Outer diameter of refrigerant pipe				
indoor unit	Gas side ØA	Liquid side ØB			
SM56, 80 type	12.7	6.4			
SM110, 140 type	15.9	9.5			

Capillary tube specifications

Model AIU-	Inner dia. × Length × Q'ty
SM56 type	Ø2 × 250 × 2, Ø2 × 350 × 1 Ø2 × 700 × 1
SM80 type	Ø2 × 250 × 3, Ø2 × 500 × 1
SM110, 140 type	Ø2 × 200 × 1, Ø2 × 300 × 2 Ø2 × 350 × 2, Ø2 × 700 × 1

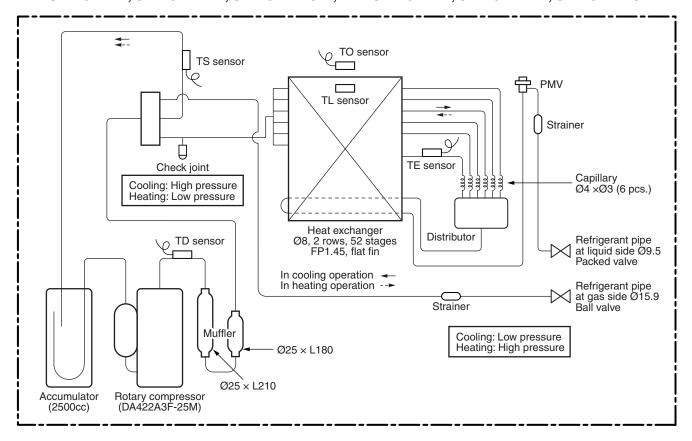
• Twin type (Combination of 2 indoor units and 1 outdoor unit)



Indoor unit	Branch pipe RBC-	Α	В	С	D
SM56 × 2	TWP30E2	6.4	12.7	9.5	15.9
SM80 × 2	TWP50E2	9.5	15.9	9.5	15.9

3-2. Outdoor Unit

RAV-SP1104AT-E, SP1104ATZ-E, SP1104ATZG-E, RAV-SP1404AT-E, SP1404ATZ-E, SP1404ATZG-E



3-3. Systematic Diagram of Refrigerating Cycle

RAV-SP1104AT-E, RAV-SP1104ATZ-E, RAV-SP1104ATZG-E

			Pres	sure			Pipe surfac	e temperature	e (°C)		Compressor		Indoor/	Outdoor
		(MI	Pa)	(kg/c	m²g)	Discharge	Suction	Indoor heat exchanger		or heat anger	drive revolution frequency	Indoor fan	temp. conditions (DB/WB) (°C)	
		Pd	Ps	Pd	Ps	(TD)	(TS)	(TC)	(TL)	(TE)	(rps)		Indoor	Outdoor
	Standard	2.57	0.99	26.2	10.1	66	14	12	44	38	38	HIGH	27/19	35/–
Cooling	Overload	3.30	1.09	33.7	11.1	78	9	13	49	43	53	HIGH	32/24	43/-
	Low load	1.74	0.75	17.8	7.7	46	7	5	32	25	21	LOW	18/15.5	-5/-
	Standard	2.32	0.73	23.7	7.4	65	3	39	2	3	43	HIGH	20/–	7/6
Heating	Overload	3.22	1.17	32.9	11.9	73	19	54	14	15	26	LOW	30/–	24/18
	Low load	2.17	0.30	22.1	3.1	87	-15	38	-14	-13	71	HIGH	15/–	-15/-

^{*} This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes 2 times of No. of compressor revolutions (rps).

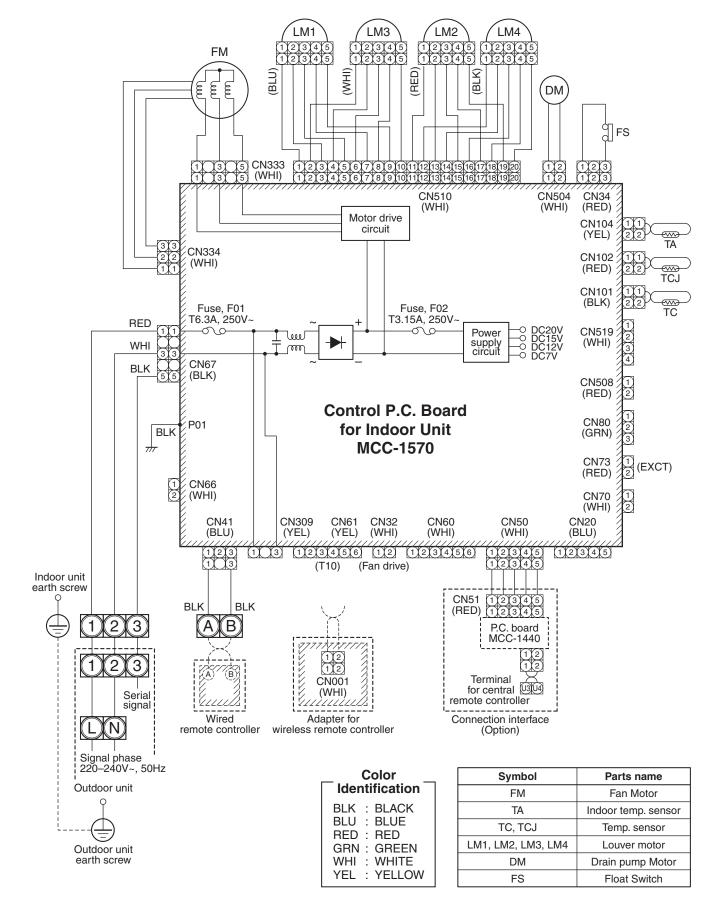
RAV-SP1404AT-E, RAV-SP1404ATZ-E, RAV-SP1404ATZG-E

		Pressure				Pipe surfac	e temperature	e (°C)		Compressor		Indoor/	Outdoor	
		(M)	Pa)	(kg/c	:m²g)	Discharge	Suction	Indoor heat exchanger		or heat langer	drive revolution frequency	Indoor fan	temp. conditions (DB/WB) (°C)	
		Pd	Ps	Pd	Ps	(TD)	(TS)	(TC)	(TL)	(TE)	(rps)		Indoor	Outdoor
	Standard	2.72	0.90	27.8	9.2	73	12	10	46	38	51	HIGH	27/19	35/-
Cooling	Overload	3.34	1.07	34.1	10.9	80	9	13	51	45	55	HIGH	32/24	43/-
	Low load	1.75	0.76	17.9	7.8	47	8	6	33	25	21	LOW	18/15.5	-5/-
	Standard	2.59	0.69	26.4	7.0	75	3	43	2	2	53	HIGH	20/–	7/6
Heating	Overload	3.13	1.05	31.9	10.7	72	16	53	12	13	26	LOW	30/–	24/18
	Low load	2.40	0.21	24.5	2.1	97	-22	42	-19	-18	90	HIGH	15/–	-15/-

^{*} This compressor has 4-pole motor. The value when compressor frequency (Hz) is measured by a clamp meter becomes two times of No. of compressor revolutions (rps).

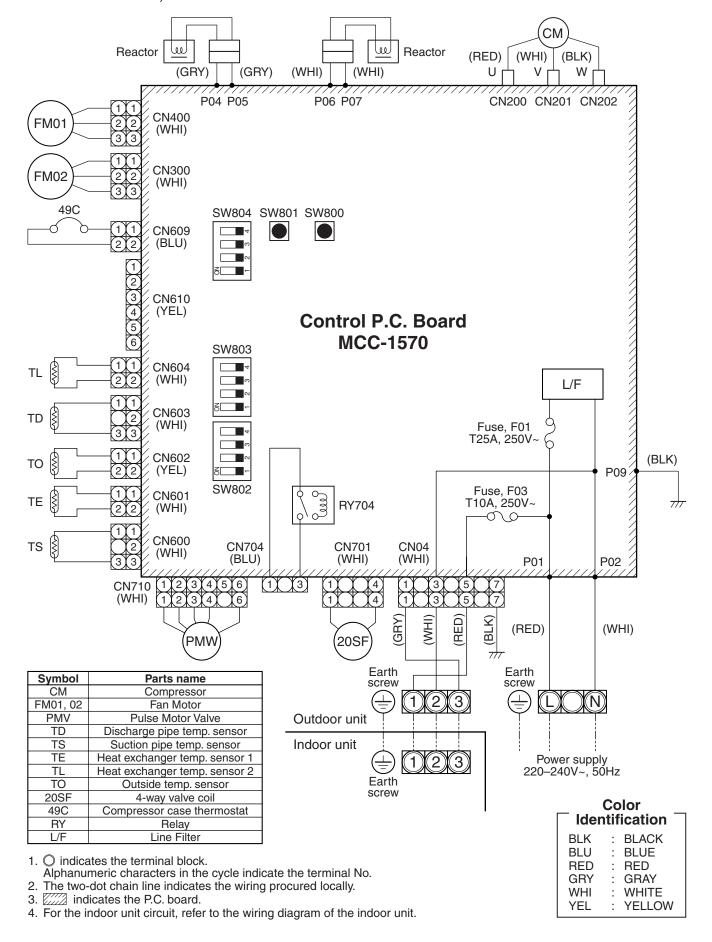
4. WIRING DIAGRAM

4-1. Indoor Unit RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E



4-2. Outdoor Unit (Wiring Diagram)

RAV-SP1104AT-E, RAV-SP1404AT-E / RAV-SP1104ATZ-E, RAV-SP1404ATZ-E / RAV-SP1104ATZG-E, RAV-SP1404ATZG-E



5. SPECIFICATIONS OF ELECTRICAL PARTS

5-1. Indoor Unit

RAV-SM564UT-E, RAV-SM804UT-E

No.	Parts name	Туре	Specifications		
1	Fan motor (for indoor) SWF-230-60-2R		Output (Rated) 60 W		
2	Thermo. sensor (TA-sensor)	328 mm	10 kΩ at 25°C		
3	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1000 mm	10 kΩ at 25°C		
4	Heat exchanger sensor (TC-sensor)	Ø6 mm, 950 mm	10 kΩ at 25°C		
5	Float switch	FS-0218-102			
6	Drain pump motor	MDP-1401			

RAV-SM1104UT-E, RAV-SM1404UT-E

No.	Parts name	Туре	Specifications
1	Fan motor	ICF-280-150-1	Output (Rated) 90 W
2	Thermo. sensor (TA-sensor)	328 mm	10 kΩ at 25°C
3	Heat exchanger sensor (TCJ-sensor)	Ø6 mm, 1000 mm	10 kΩ at 25°C
4	Heat exchanger sensor (TC-sensor)	Ø6 mm, 950 mm	10 kΩ at 25°C
5	Float switch	FS-0218-102	
6	Drain pump motor	MDP-1401	

5-2. Outdoor Unit (Parts Ratings)

RAV-SP1104AT-E, RAV-SP1404AT-E / RAV-SP1104ATZ-E, RAV-SP1404ATZ-E / RAV-SP1104ATZG-E, RAV-SP1404ATZG-E

No.	Parts name	Туре	Specifications
1	Compressor	DA422A3F-25M	_
2	Outdoor fan motor	ICF-280-A100-1	Output 100W
3	Reactor	CH-62	5.7mH, 18.5A
4	4-way valve coil	VHV-01AP552B1	AC240V
5	PMV coil	UKV-A038	DC12V
6	P.C. board	MCC-1571	AC220 – 240V
7	Fuse (Mounted on P.C. board)		AC250V, 25A
8	Fuse (Mounted on P.C. board)		AC250V, 10A
9	Fuse (Mounted on P.C. board)	_	AC250V, 3.15A
10	Outdoor temp. sensor (TO sensor)	_	10 kΩ at 25°C
11	Heat exchanger sensor (Te sensor)	_	10 kΩ at 25°C
12	Discharge temp. sensor (Td sensor)	_	50 kΩ at 25°C
13	Heat exchanger mid. Temp sensor (TL sensor)	_	10 kΩ at 25°C
14	Compressor thermo. (Protection)	US-622	OFF: 125 ± 4°C, ON: 90 ± 5°C

5-3. Accessory Separate Sold Parts

RBC-U31PG(WS)-E, RBC-U31PG(W)-E (Ceiling panel) RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

No.	Parts name	Туре	Specifications
1	Motor-louver	MP24ZN3N	DC 12 V
2			

6. REFRIGERANT R410A

This air conditioner adopts the new refrigerant HFC (R410A) which does not damage the ozone layer.

The working pressure of the new refrigerant R410A is 1.6 times higher than conventional refrigerant (R22). The refrigerating oil is also changed in accordance with change of refrigerant, so be careful that water, dust, and existing refrigerant or refrigerating oil are not entered in the refrigerant cycle of the air conditioner using the new refrigerant during installation work or servicing time.

The next section describes the precautions for air conditioner using the new refrigerant.

Conforming to contents of the next section together with the general cautions included in this manual, perform the correct and safe work.

6-1. Safety During Installation/Servicing

As R410A's pressure is about 1.6 times higher than that of R22, improper installation/servicing may cause a serious trouble. By using tools and materials exclusive for R410A, it is necessary to carry out installation/servicing safely while taking the following precautions into consideration.

- Never use refrigerant other than R410A in an air conditioner which is designed to operate with R410A.
 - If other refrigerant than R410A is mixed, pressure in the refrigeration cycle becomes abnormally high, and it may cause personal injury, etc. by a rupture.
- Confirm the used refrigerant name, and use tools and materials exclusive for the refrigerant R410A.
 The refrigerant name R410A is indicated on the visible place of the outdoor unit of the air conditioner using R410A as refrigerant.
 - To prevent mischarging, the diameter of the service port differs from that of R22.
- If a refrigeration gas leakage occurs during installation/servicing, be sure to ventilate fully.
 If the refrigerant gas comes into contact with fire, a poisonous gas may occur.
- 4. When installing or removing an air conditioner, do not allow air or moisture to remain in the refrigeration cycle.
 - Otherwise, pressure in the refrigeration cycle may become abnormally high so that a rupture or personal injury may be caused.
- After completion of installation work, check to make sure that there is no refrigeration gas leakage.
 - If the refrigerant gas leaks into the room, coming into contact with fire in the fan-driven heater, space heater, etc., a poisonous gas may occur.

- When an air conditioning system charged with a large volume of refrigerant is installed in a small room, it is necessary to exercise care so that, even when refrigerant leaks, its concentration does not exceed the marginal level.
 - If the refrigerant gas leakage occurs and its concentration exceeds the marginal level, an oxygen starvation accident may result.
- Be sure to carry out installation or removal according to the installation manual.
 Improper installation may cause refrigeration trouble, water leakage, electric shock, fire, etc.
- 8. Unauthorized modifications to the air conditioner may be dangerous. If a breakdown occurs please call a qualified air conditioner technician or electrician.
 - Improper repair's may result in water leakage, electric shock and fire, etc.

6-2. Refrigerant Piping Installation6-2-1. Piping Materials and Joints Used

For the refrigerant piping installation, copper pipes and joints are mainly used.

Copper pipes and joints suitable for the refrigerant must be chosen and installed.

Furthermore, it is necessary to use clean copper pipes and joints whose interior surfaces are less affected by contaminants.

1. Copper Pipes

It is necessary to use seamless copper pipes which are made of either copper or copper alloy and it is desirable that the amount of residual oil is less than 40 mg/10 m.

Do not use copper pipes having a collapsed, deformed or discolored portion (especially on the interior surface).

Otherwise, the expansion valve or capillary tube may become blocked with contaminants.

As an air conditioner using R410A incurs pressure higher than when using R22, it is necessary to choose adequate materials.

Thicknesses of copper pipes used with R410A are as shown in Table 6-2-1. Never use copper pipes thinner than 0.8mm even when it is available on the market.

NOTE:

Refer to the "6-6. Instructions for Re-use Piping of R22 or R407C".

Table 6-2-1 Thicknesses of annealed copper pipes

		Thickness (mm)			
Nominal diameter	Outer diameter (mm)	R410A	R22		
1/4	6.4	0.80	0.80		
3/8	9.5	0.80	0.80		
1/2	12.7	0.80	0.80		
5/8	15.9	1.00	1.00		

1. Joints

For copper pipes, flare joints or socket joints are used. Prior to use, be sure to remove all contaminants.

a) Flare Joints

Flare joints used to connect the copper pipes cannot be used for pipings whose outer diameter exceeds 20 mm. In such a case, socket joints can be used.

Sizes of flare pipe ends, flare joint ends and flare nuts are as shown in Tables 6-2-3 to 6-2-5 below.

b) Socket Joints

Socket joints are such that they are brazed for connections, and used mainly for thick pipings whose diameter is larger than 20 mm. Thicknesses of socket joints are as shown in Table 6-2-2.

Table 6-2-2 Minimum thicknesses of socket joints

Nominal diameter	Reference outer diameter of copper pipe jointed (mm)	Minimum joint thickness (mm)
1/4	6.4	0.50
3/8	9.5	0.60
1/2	12.7	0.70
5/8	15.9	0.80

6-2-2. Processing of Piping Materials

When performing the refrigerant piping installation, care should be taken to ensure that water or dust does not enter the pipe interior, that no other oil other than lubricating oils used in the installed air conditioner is used, and that refrigerant does not leak. When using lubricating oils in the piping processing, use such lubricating oils whose water content has been removed. When stored, be sure to seal the container with an airtight cap or any other cover.

1. Flare Processing Procedures and Precautions

- a) Cutting the Pipe
 - By means of a pipe cutter, slowly cut the pipe so that it is not deformed.
- b) Removing Burrs and Chips
 - If the flared section has chips or burrs, refrigerant leakage may occur.
 - Carefully remove all burrs and clean the cut surface before installation.

- c) Insertion of Flare Nut
- d) Flare Processing

Make certain that a clamp bar and copper pipe have been cleaned.

By means of the clamp bar, perform the flare processing correctly.

Use either a flare tool for R410A or conventional flare tool.

Flare processing dimensions differ according to the type of flare tool.

When using a conventional flare tool, be sure to secure "dimension A" by using a gauge for size adjustment.

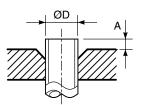


Fig. 6-2-1 Flare processing dimensions

Table 6-2-3 Dimensions related to flare processing for R410A / R22

					A (mm)			
Nominal diameter	Outer diameter (mm)	Thickness (mm)	Flare tool for R410A, R22		nal flare tool 10A)	Conventional flare tool (R22)		
	• • • • • • • • • • • • • • • • • • • •		clutch type	Clutch type	Wing nut type	Clutch type	Wing nut type	
1/4	6.4	0.8	0 to 0.5	1.0 to 1.5	1.5 to 2.0	0.5 to 1.0	1.0 to 1.5	
3/8	9.5	0.8	0 to 0.5	1.0 to 1.5	1.5 to 2.0	0.5 to 1.0	1.0 to 1.5	
1/2	12.7	0.8	0 to 0.5	1.0 to 1.5	2.0 to 2.5	0.5 to 1.0	1.5 to 2.0	
5/8	15.9	1.0	0 to 0.5	1.0 to 1.5	2.0 to 2.5	0.5 to 1.0	1.5 to 2.0	

Table 6-2-4 Flare and flare nut dimensions for R410A

Nominal	Outer diameter	Thickness (mm)		Dimens	Flare nut width		
diameter	(mm)		Α	В	С	D	(mm)
1/4	6.4	0.8	9.1	9.2	6.5	13	17
3/8	9.5	0.8	13.2	13.5	9.7	20	22
1/2	12.7	0.8	16.6	16.0	12.9	23	26
5/8	15.9	1.0	19.7	19.0	16.0	25	29

Table 6-2-5 Flare and flare nut dimensions for R22

Nominal diameter	Outer diameter (mm)	Thickness (mm)	Dimension (mm)				Flare nut width
			Α	В	С	D	(mm)
1/4	6.4	0.8	9.1	9.2	6.5	13	17
3/8	9.5	0.8	13.0	13.5	9.7	20	22
1/2	12.7	0.8	16.2	16.0	12.9	20	24
5/8	15.9	1.0	19.4	19.0	16.0	23	27
3/4	19.0	1.0	23.3	24.0	19.2	34	36

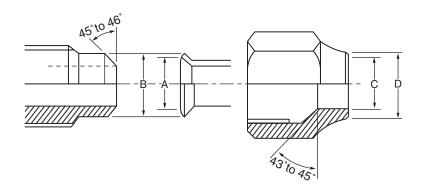


Fig. 6-2-2 Relations between flare nut and flare seal surface

- 2. Flare Connecting Procedures and Precautions
 - a) Make sure that the flare and union portions do not have any scar or dust, etc.
 - b) Correctly align the processed flare surface with the union axis.
 - c) Tighten the flare with designated torque by means of a torque wrench. The tightening torque for R410A is the same as that for conventional R22. Incidentally, when the torque is weak, the gas leakage may occur. When it is strong, the flare nut may crack and may be made non-removable. When choosing the tightening torque, comply with values designated by manufacturers. Table 6-2-6 shows reference values.

NOTE:

When applying oil to the flare surface, be sure to use oil designated by the manufacturer. If any other oil is used, the lubricating oils may deteriorate and cause the compressor to burn out.

Table 6-2-6 Tightening torque of flare for R410A [Reference values]

Nominal diameter	Outer diameter (mm)	Tightening torque N•m (kgf•m)	Tightening torque of torque wrenches available on the market N•m (kgf•m)
1/4	6.4	14 to 18 (1.4 to 1.8)	16 (1.6), 18 (1.8)
3/8	9.5	33 to 42 (3.3 to 4.2)	42 (4.2)
1/2	12.7	50 to 62 (5.0 to 6.2)	55 (5.5)
5/8	15.9	63 to 77 (6.3 to 7.7)	65 (6.5)

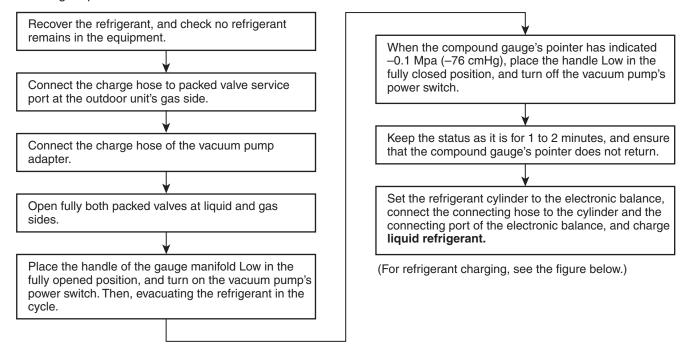
6-3. Tools

6-3-1. Required Tools

Refer to the "4. Tools" (Page 8)

6-4. Recharging of Refrigerant

When it is necessary to recharge refrigerant, charge the specified amount of new refrigerant according to the following steps.



- 1) Never charge refrigerant exceeding the specified amount.
- 2) If the specified amount of refrigerant cannot be charged, charge refrigerant bit by bit in COOL mode.
- 3) Do not carry out additional charging. When additional charging is carried out if refrigerant leaks, the refrigerant composition changes in the refrigeration cycle, that is characteristics of the air conditioner changes, refrigerant exceeding the specified amount is charged, and working pressure in the refrigeration cycle becomes abnormally high pressure, and may cause a rupture or personal injury.

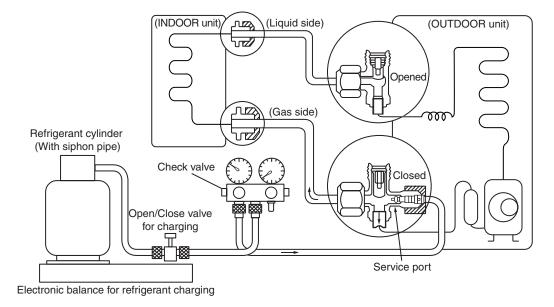


Fig. 6-4-1 Configuration of refrigerant charging

- 1) Be sure to make setting so that liquid can be charged.
- 2) When using a cylinder equipped with a siphon, liquid can be charged without turning it upside down.

It is necessary for charging refrigerant under condition of liquid because R410A is mixed type of refrigerant. Accordingly, when charging refrigerant from the refrigerant cylinder to the equipment, charge it turning the cylinder upside down if cylinder is not equipped with siphon.

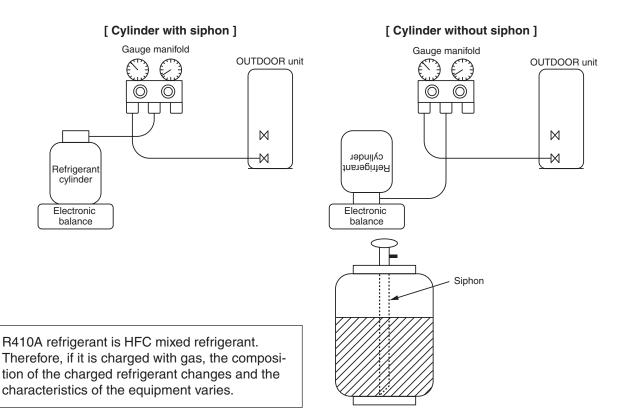


Fig. 6-4-2

6-5. Brazing of Pipes

6-5-1. Materials for Brazing

1. Silver brazing filler

Silver brazing filler is an alloy mainly composed of silver and copper. It is used to join iron, copper or copper alloy, and is relatively expensive though it excels in solderability.

2. Phosphor bronze brazing filler

Phosphor bronze brazing filler is generally used to join copper or copper alloy.

3. Low temperature brazing filler

Low temperature brazing filler is generally called solder, and is an alloy of tin and lead. Since it is weak in adhesive strength, do not use it for refrigerant pipes.

- Phosphor bronze brazing filler tends to react with sulfur and produce a fragile compound water solution, which may cause a gas leakage. Therefore, use any other type of brazing filler at a hot spring resort, etc., and coat the surface with a paint.
- 2) When performing brazing again at time of servicing, use the same type of brazing filler.

6-5-2. Flux

1. Reason why flux is necessary

- By removing the oxide film and any foreign matter on the metal surface, it assists the flow of brazing filler.
- In the brazing process, it prevents the metal surface from being oxidized.
- By reducing the brazing filler's surface tension, the brazing filler adheres better to the treated metal.

2. Characteristics required for flux

- Activated temperature of flux coincides with the brazing temperature.
- Due to a wide effective temperature range, flux is hard to carbonize.
- · It is easy to remove slag after brazing.
- The corrosive action to the treated metal and brazing filler is minimum.
- It excels in coating performance and is harmless to the human body.

As the flux works in a complicated manner as described above, it is necessary to select an adequate type of flux according to the type and shape of treated metal, type of brazing filler and brazing method, etc.

3. Types of flux

Noncorrosive flux

Generally, it is a compound of borax and boric acid.

It is effective in case where the brazing temperature is higher than 800°C.

Activated flux

Most of fluxes generally used for silver brazing are this type.

It features an increased oxide film removing capability due to the addition of compounds such as potassium fluoride, potassium chloride and sodium fluoride to the borax-boric acid compound.

4. Piping materials for brazing and used brazing filler/flux

Piping material	Used brazing filler	Used flux
Copper - Copper	Phosphor copper	Do not use
Copper - Iron	Silver	Paste flux
Iron - Iron	Silver	Vapor flux

- 1) Do not enter flux into the refrigeration cycle.
- When chlorine contained in the flux remains within the pipe, the lubricating oil deteriorates. Therefore, use a flux which does not contain chlorine.
- 3) When adding water to the flux, use water which does not contain chlorine (e.g. distilled water or ion-exchange water).
- 4) Remove the flux after brazing.

6-5-3. Brazing

As brazing work requires sophisticated techniques, experiences based upon a theoretical knowledge, it must be performed by a person qualified.

In order to prevent the oxide film from occurring in the pipe interior during brazing, it is effective to proceed with brazing while letting dry Nitrogen gas flow.

Never use gas other than Nitrogen gas.

1. Brazing method to prevent oxidation

- 1) Attach a reducing valve and a flow-meter to the Nitrogen gas cylinder.
- 2) Use a copper pipe to direct the piping material, and attach a flow-meter to the cylinder.
- Apply a seal onto the clearance between the piping material and inserted copper pipe for Nitrogen in order to prevent backflow of the Nitrogen gas.
- 4) When the Nitrogen gas is flowing, be sure to keep the piping end open.
- 5) Adjust the flow rate of Nitrogen gas so that it is lower than 0.05 m³/Hr or 0.02 MPa (0.2kgf/cm²) by means of the reducing valve.
- 6) After performing the steps above, keep the Nitrogen gas flowing until the pipe cools down to a certain extent (temperature at which pipes are touchable with hands).
- 7) Remove the flux completely after brazing.

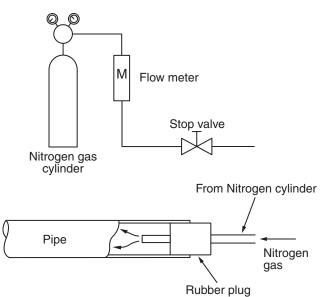


Fig. 6-5-1 Prevention of oxidation during brazing

6-6. Instructions for Re-use Piping of R22 or R407C

Instruction of Works:

The existing R22 and R407C piping can be reused for our digital inverter R410A products installations.

NOTE)

Confirmation of existence of scratch or dent of the former pipes to be applied and also confirmation of reliability of the pipe strength are conventionally referred to the local site.

If the definite conditions can be cleared, it is possible to update the existing R22 and R407C pipes to those for R410A models.

6-6-1. Basic Conditions Need to Reuse the Existing Pipe

Check and observe three conditions of the refrigerant piping works.

- 1. Dry (There is no moisture inside of the pipes.)
- 2. Clean (There is no dust inside of the pipes.)
- 3. Tight (There is no refrigerant leak.)

6-6-2. Restricted Items to Use the Existing Pipes

In the following cases, the existing pipes cannot be reused as they are. Clean the existing pipes or exchange them with new pipes.

- 1. When a scratch or dent is heavy, be sure to use the new pipes for the works.
- 2. When the thickness of the existing pipe is thinner than the specified "Pipe diameter and thickness" be sure to use the new pipes for the works.
 - The operating pressure of R410A is high
 (1.6 times of R22 and R407C). If there is a scratch
 or dent on the pipe or thinner pipe is used, the
 pressure strength is poor and may cause break age of the pipe at the worst.

* Pipe diameter and thickness (mm)

Pipe outer	Ø6.4	Ø9.5	Ø12.7	Ø15.9	Ø19.0	
	R410A					
Thickness	R22 (R407C)	0.8	0.8	0.8	1.0	1.0

- In case that the pipe diameter is Ø12.7 mm or less and the thickness is less than 0.7 mm, be sure to use the new pipes for works.
- 3. The pipes are left as coming out or gas leaks. (Poor refrigerant)
 - There is possibility that rain water or air including moisture enters in the pipe.
- Refrigerant recovery is impossible. (Refrigerant recovery by the pump-down operation on the existing air conditioner)
 - There is possibility that a large quantity of poor oil or moisture remains inside of the pipe.
- A dryer on the market is attached to the existing pipes.
 - There is possibility that copper green rust generated.

- 6. Check the oil when the existing air conditioner was removed after refrigerant had been recovered. In this case, if the oil is judged as clearly different compared with normal oil
 - The refrigerator oil is copper rust green:
 There is possibility that moisture is mixed with the oil and rust generates inside of the pipe.
 - There is discolored oil, a large quantity of the remains, or bad smell.
 - A large quantity of sparkle remained wear-out powder is observed in the refrigerator oil.
- 7. The air conditioner which compressor was exchanged due to a faulty compressor. When the discolored oil, a large quantity of the remains, mixture of foreign matter, or a large quantity of sparkle remained wear-out powder is observed, the cause of trouble will occur.
- Installation and removal of the air conditioner are repeated with temporary installation by lease and etc.
- In case that type of the refrigerator oil of the existing air conditioner is other than the following oil (Mineral oil), Suniso, Freol-S, MS (Synthetic oil), alkyl benzene (HAB, Barrel-freeze), ester series, PVE only of ether series.
 - Winding-insulation of the compressor may become inferior.

NOTE)

The above descriptions are results of confirmation by our company and they are views on our air conditioners, but they do not guarantee the use of the existing pipes of the air conditioner that adopted R410A in other companies.

6-6-3. Branching Pipe for Simultaneous Operation System

• In the concurrent twin system, when TOSHIBAspecified branching pipe is used, it can be reused. Branching pipe model name:

RBC-TWP30E-2, RBC-TWP50E-2

On the existing air conditioner for simultaneous operation system (twin system), there is a case of using branch pipe that has insufficient compressive strength.

In this case please change it to the branch pipe for R410A.

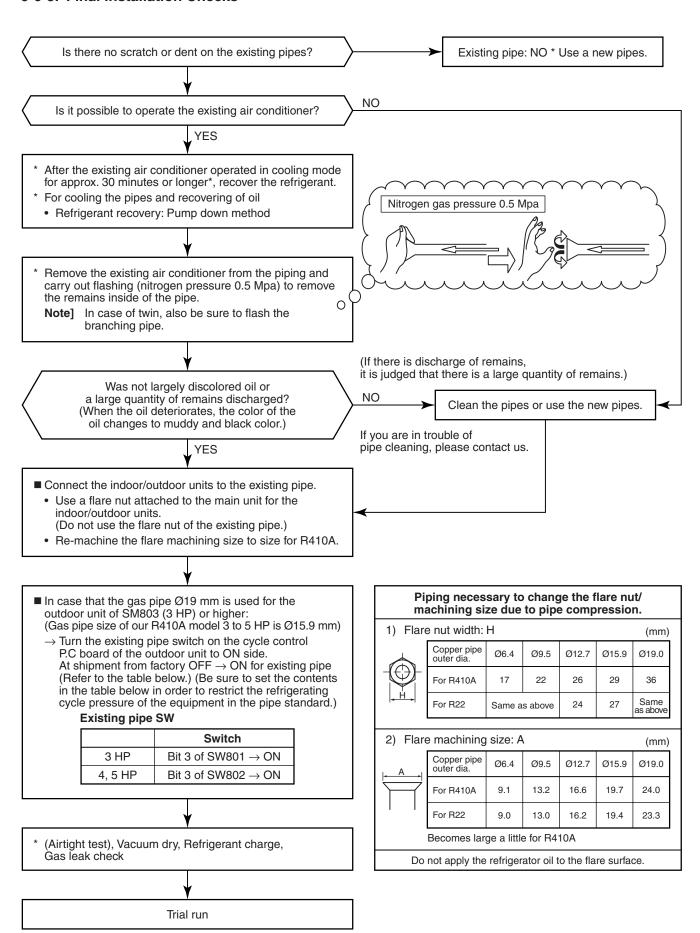
6-6-4. Curing of Pipes

When removing and opening the indoor unit or outdoor unit for a long time, cure the pipes as follows:

- Otherwise rust may generate when moisture or foreign matter due to dewing enters in the pipes.
- The rust cannot be removed by cleaning, and a new piping work is necessary.

Place position	Term	Curing manner
Outdoors	1 month or more	Pinching
Outdoors	Less than 1 month	Pinching or taping
Indoors	Every time	Finding of taping

6-6-5. Final Installation Checks



6-6-6. Handling of Existing Pipe

When using the existing pipe, carefully check it for the following:

- Wall thickness (within the specified range)
- · Scratches and dents
- · Water, oil, dirt, or dust in the pipe
- · Flare looseness and leakage from welds
- · Deterioration of copper pipe and heat insulator

Cautions for using existing pipe

- Do not reuse the flare to prevent gas leak.
 Replace it with the supplied flare nut and then process it to a flare.
- Blow nitrogen gas or use an appropriate means to keep the inside of the pipe clean.
 - If discolored oil or much residue is discharged, wash the pipe.
- Check welds, if any, on the pipe for gas leak.
 When the pipe corresponds to any of the following, do not use it. Install a new pipe instead.
- The pipe has been open (disconnected from indoor unit or outdoor unit) for a long period.
- The pipe has been connected to an outdoor unit that does not use refrigerant R22, R410A or R407C.
- The existing pipe must have a wall thickness equal to or larger than the following thickness.

Reference outside diameter (mm)	Wall thickness (mm)
Ø9.5	0.8
Ø15.9	1.0
Ø19.1	1.0

- Never use any pipe with a wall thickness less than these thicknesses due to insufficient pressure capacity.
- To use an existing Ø19.1 mm pipe, set bit 3 of SW802 (switch for existing pipe) on the P.C. board of the outdoor unit to ON. In this case, the heating performance may be reduced depending on the outside air temperature and room temperature.

sw	SW802					
When shipped from factory	When using existing pipe					
ON 1 2 3 4	ON 1 2 3 4					

6-6-7. Recovery Method of Refrigerant for RAV-SP1104AT-E, RAV-SP1404AT-E

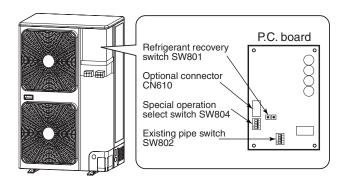
 Use the refrigerant recovery switch SW801 on the P.C. board of the outdoor unit to recover refrigerant when the indoor unit or outdoor unit is moved.

Operation method

- 1. Turn on the power of the air conditioner.
- 2. Select the FAN mode for indoor unit operation with the remote controller.
- 3. Set SW804 on the P.C. board of the outdoor unit to all OFF, and then push SW801 for one second or more.

The air conditioner enters the forced cooling mode for up to 10 minutes.

- Operation or handling the valve to recover refrigerant during this time period.
- 4. Upon completion of refrigerant recovery, close the valve and push SW801 for at least one second to stop operation.
- 5. Turn off the power.



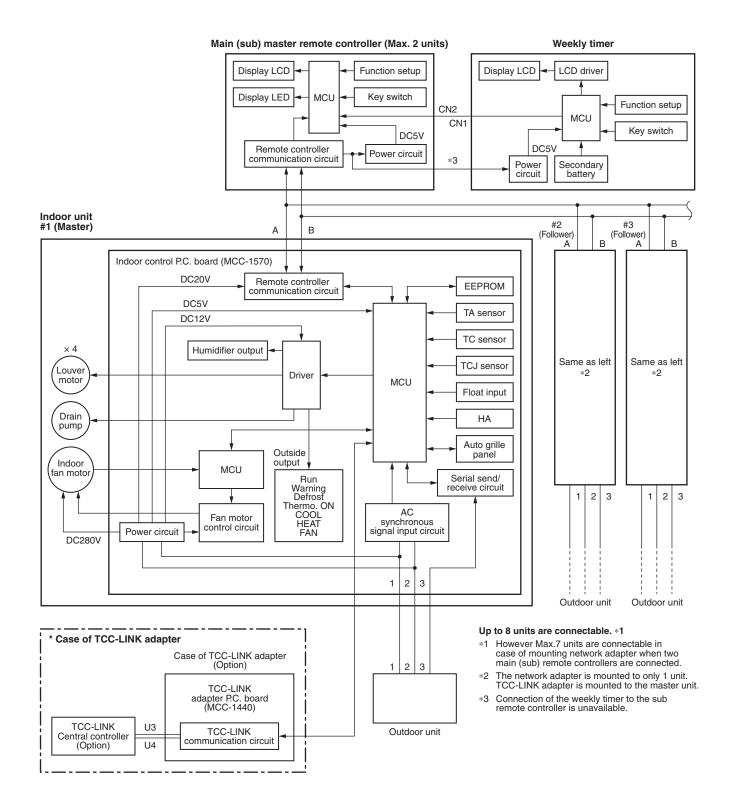
M DANGER

Take care for an electric shock because the P.C. board is electrified.

7. INDOOR CONTROL CIRCUIT

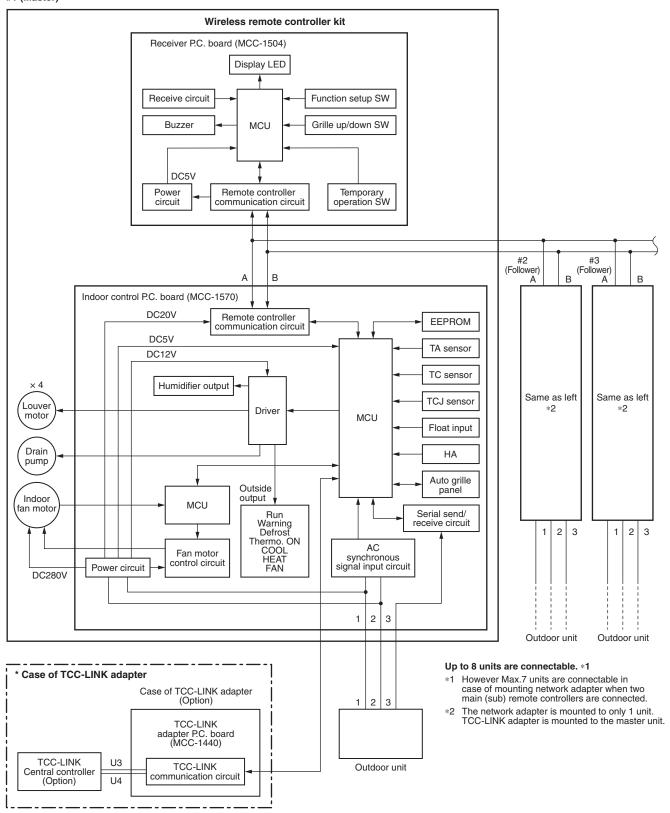
7-1. Indoor Controller Block Diagram

7-1-1. Connection of Main (Sub) Remote Controller

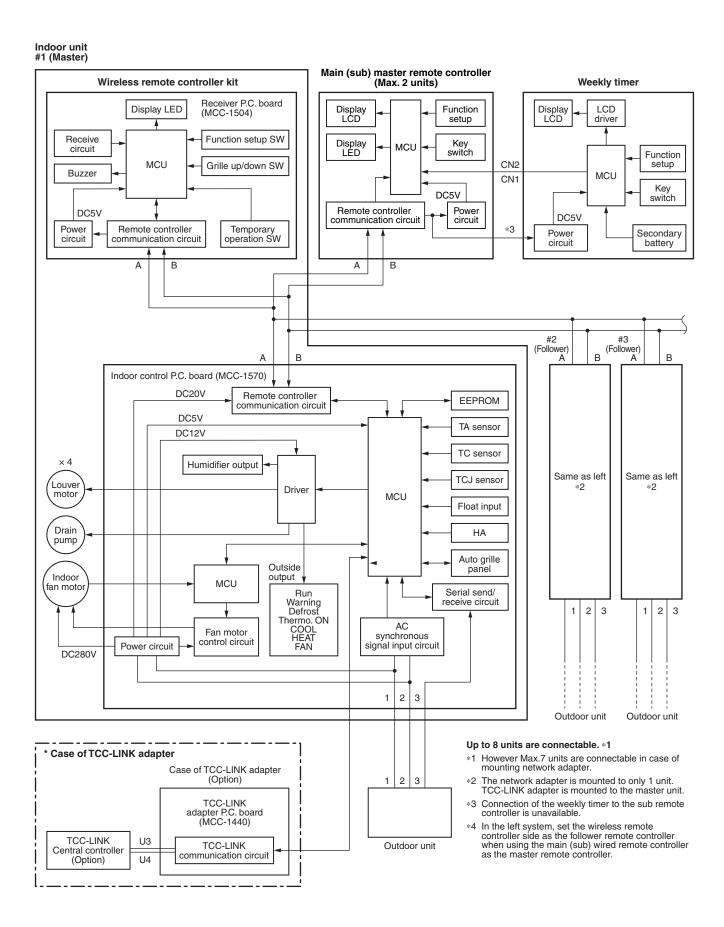


7-1-2. Connection of Wireless Remote Controller Kit

Indoor unit #1 (Master)



7-1-3. Connection of Both Main (Sub) Remote Controller and Wireless Remote Controller Kit



7-2. Control Specifications

No.	Item	Outl	Remarks			
1	When power supply is reset	Distinction of outdood When the power supplies and the condistinguished result. Setting of indoor far adjustment Based on EEPROM speed and the exister.	pply is reset ntrol is select n speed and data, selec	ted according existence of the setting of the setti	Air speed (rpm)/ Air direction adjustment	
2	Operation mode selection	Based on the opera remote controller, the				
		Remote controller command		Control outli	ne	
		STOP	Air condition	oner stops.		
		FAN	Fan operat	•		
		COOL	Cooling op			
		DRY	Dry operat			
		HEAT				Ta: Room temp.
		+1.0 - Ta (°C) Ts+α - -1.0 -	 COOL/HEAT operation mode is automatically selected by Ta, Ts and To for operation. The operation is performed as shown in the following figure according to Ta value at the first time only. (In the range of Ts + α -1 < Ta < Ts + α + 1, Cooling thermo. OFF (Fan)/Setup air volume operation continues.) Cooling operation ////////////////////////////////////			Ts: Setup temp. To: Outside temp.
		• α is corrected acco			l	
		Outside temp.	Со	rrection value	k – dea	
		No To To ≥ 24°C		0K -1K		k = deg
		24 > To ≥ 18°C		0K		
		To < 18°C		+1K		
		To error		0K		
3	Room temp. control	1) Adjustment range: R	emote contro	oller setup ten	nperature (°C)	
	30		COOL/DRY	HEAT	AUTO	
		Wired type	18 to 29	18 to 29	18 to 29	
		Wireless type	18 to 30	16 to 30	17 to 27	

No.	Item	Outline of specifications							Remarks
3	Room temp.	Using the Item code 06, the setup temperature in heating operation can be corrected.							Shift of suction temperature in heating
	(Continued)	Setup data	ı	0	2	4	6		operation
		Setup temp. corr	ection	+0°C	+2°C	+4°C	+6°C		
		Setting at shipm	nent						
		Setup data	2						
4	Automatic capacity control (GA control)	 Based on the difference between Ta and Ts, the operation frequency is instructed to the outdoor unit. Cooling operation Every 90 seconds, the room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected. Ta (n) – Ts (n) : Room temp. difference Counts of detection (n-1) – Ts (n) : Varied room temp. value (n-1) = Ts (n) : Varied room temp. value (n-1) = Ts (n) : Varied room temperature difference between temperature detected by Ta and Ts and the varied room temperature value are calculated to obtain the correction value of the frequency command and then the present frequency command is corrected. Ts (n) – Ta (n) : Room temp. difference (counts of detection) Ta (n) – Ta (n) : Room temp. value (counts of detection) 							
5	Automatic cooling/heating control	1) The judgment of shown below. We and after thermoder exchanges to comparentheses shows the sho	Cooling open cooli	pooling OFF eration (ity control 4. on of ro	ds again operation Descrip of coolin (Coolin leating 0 minute (Thermo	st Tsh 1 n (Therr tion in the strong ON/Component of the strong on the s	0 minute no. OFF ne DFF. ofter exchange	es)	Tsc: Setup temp. in cooling operation Tsh: Setup temp. in heating operation + temp. correction of room temp. control

No.	Item	Outline of specifications	Remarks
6	Air speed selection	Operation with (HH), (H), (L) or [AUTO] mode is carried out by the command from the remote controller. When the air speed mode [AUTO] is selected, the air speed varies by the difference between Ta and Ts.	HH > H+ > H > L+ > L > UL
		Ta (°C) +3.0 +2.5 HH (HH) C +1.5 H+ (HH) D +1.0 +0.5 Tsc L (H) C H (HH) F G	
		 Controlling operation in case when thermo of remote controller works is same as a case when thermo of the body works. If the air speed has been changed once, it is not changed for 3 minutes. However when the air volume is exchanged, the air speed changes. When cooling operation has started, select a downward slope for the air speed, that is, the high position. If the temperature is just on the difference boundary, the air speed does not change. Mode in the parentheses indicates one in automatic cooling operation. 	
		Ta (°C) (-0.5) -1.0	
		 Value in the parentheses indicates one when thermostat of the remote controller works. Value without parentheses indicates one when thermostat of the body works. If the air speed has been changed once, it is not changed for 1 minute. However when the air speed I exchanged, the air speed changes. When heating operation has started, select an upward slope for the air speed, that is, the high position. If the temperature is just on the difference boundary, the air speed does not change. Mode in the parentheses indicates one in automatic heating operation. In Tc ≥ 60°C, the air speed increases by 1 step. 	Tc: Indoor heat exchanger sensor temperature

No.	Item	Outline of specifications							Remarks		
6	Air speed selection (Continued)	Item code [5d]	· -	idard		De 1		ie 3	-	De 6	Selection of high ceiling type
	,	SW501 (1)/	(2) OFF	/OFF	ON/	OFF	OFF	/ON		/ON	* '
		Тар	HEAT	COOL	HEAT	COOL	HEAT	COOL	HEAT	COOL	Item code: [5d] or selection of high
		F1					HH	НН	НН	HH	ceiling on P.C. board
		F2			HH	HH					SW501
		F3				H+	H+, H	H+, H	H+, H L+, L	H+, H L+, L	
		F4			H+						
		F5		HH		Н					
		F6	HH		Н		L+	L+			
		F7	H+	H+			L	L			
		F8		Н		L+					
		F9	Н		L+	L					
		FA	1.	L+	L						
		FB	L+	L							
		FC FD	L	UL		UL		UL		UL	
				UL		UL		OL		OL	
		Тар	SN	156	SN	180	SM	110	SM	140	
							speed (
		F1		10		30	70			00	
		F2	_	50		90	67			70	
		F3		00		30		30		60	
		F4		50		70		10		50	
		F5		400 390		50		20		40	
		F6 F7		90 70		40 10		0		30 60	
		F8		70 50		80		50 90		90	
		F9		40		70		30		30	
		FA		30		50		50		60	
		FB	3:	20	3	30	40	00	4:	30	
		FC	3	10	3	20	40	00	4:	20	
		FD	2	50	2	50	30	00	3	00	
		 3) In heating is turned 4) If Ta ≥ 25 defrost of operates entered in (Item 7). 5) In automore frequency cooling/h Ta (°C) 47 - 42 - 6) Dry clear 	off. off. off. off. off. off. off. off.	heatir has be mode of coo ng/hea is set beratio	ng ope een cle or hig ol air o ating o large	eration eared, her m lischai pperati r than	has s the ai ode fo rge pre on, the that in	tarted r cond r 1 mireventive revolution the statement of the statement is to mating the statement of the statement is to mating as the statement of th	and vitione nute a ve con ution tandar revolution restriction show	when r fter Tc trol rd ution cted in ting rn in	However only when the high ceiling selection is set to [Standard]
		When pe operation	rforming	dry op					e coo	ling	

No.	Item	Outline of specifications	Remarks
7	Cool air discharge preventive control	1) In heating operation, the indoor fan is controlled based on the detected temperature of Tc sensor or Tcj sensor. As shown below, the upper limit of the revolution frequency is restricted. However B zone is assumed as C zone for 6 minutes and after when the compressor activated. In defrost operation, the control value of Tc is shifted by 6°C. Tc Tc Tc C Tc	In D and E zones, the priority is given to air volume selection setup of remote controller. In A zone while thermo is ON, [PRE-HEAT (*) (Heating ready)] is displayed.
8	Freeze preventive control (Low temperature release)	1) The cooling operation (including Dry operation) is performed as follows based on the detected temperature of Tc sensor or Tcj sensor. When [J] zone is detected for 6 minutes (Following figure), the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [J] zone. In [K] zone, time counting is interrupted and the operation is held. When [I] zone is detected, the timer is cleared and the operation returns to the normal operation. If the commanded frequency becomes S0 because the operation continues in [J] zone, the return temperature A is raised from 5°C to 12°C until [I] zone is detected and the indoor fan operates with [L] mode.	Tcj: Indoor heat exchanger sensor temperature
		In heating operation, the freeze-preventive control works if 4-way valve is not exchanged and the following conditions are satisfied. (However the temperature for J zone dashing control is changed from 2°C to −5°C.) <conditions> • When ① or ② is established 5 minutes after activation. ① Tcn ≤ Tc (n − 1) − 5 ② Tcn < Tc (n − 1) − 1 and Tcn ≤ Ta < 5°C</conditions>	Tcn: Tc temperature when 5 minutes elapsed after activation Tc (n – 1): Tc temperature at start time

No.	Item	Outline of specifications	Remarks
9	High-temp. release control	1) The heating operation is performed as follows based on the detected temperature of Tc sensor or Tcj sensor. • When [M] zone is detected, the commanded frequency is decreased from the real operation frequency. After then the commanded frequency changes every 30 seconds while operation is performed in [M] zone. • In [N] zone, the commanded frequency is held. • When [L] zone is detected, the commanded frequency is returned to the original value by approx. 6Hz every 60 seconds. Setup at shipment Control temp. (°C)	However this control is ignored in case of the follower unit of the twin.
		NOTE: When the operation has started or when Tc or Tcj < 30°C at start of the operation or after operation start, temperature is controlled between values in parentheses of A and B.	Same status as that when "thermostat-OFF" (status that the air conditioner enters in the room temp. monitor mode when the temperature reached the setup temperature on the remote controller)
10	Drain pump control	 In cooling operation (including Dry operation), the drain pump is usually operated. If the float switch works while drain pump drives, the compressor stops, the drain pump continues the operation, and a check code is output. If the float switch works while drain pump stops, the compressor stops and the drain pump operates. If the float switch keeps operating for approx. 4 minutes, a check code is output. If the humidifier "Provided" is judged, compressor [ON], fan [ON] and TC sensor value ≥ 33°C, the drain pump operates. 	Check code [P10]
11	After-heat elimination	When heating operation stops, in some cases, the indoor fan operates with (L) for approx. 30 seconds.	[Dry operation 🚳] is displayed.

When the lower position is changed, the position moves necessarily to downward discharge position once to return to the set position. The lower position can be set up in the following operation range. In cooling/dry operation In a group twin/triple operation, the lower positions can be set up collectively or individually. 2) Swing setup In group twin operation, the lower positions can be set up collectively or individually. 3) When the unit stopped or the warning was output, the lower is automatically set to full closed position. 4) When PRE-HEAT @ (Heating ready) is displayed (Heating operation started or defrost operation is performed), heating thermo is off or self-cleaning is performed, the lower is automatically set to horizontal discharge position. * The lower which air direction is individually set to thorizontal discharge position. * The lower which air direction is individually set to thorizontal discharge position. * The lower which air direction is individually set to thorizontal discharge position when PRE-HEAT @ (Heating ready) is displayed, heating thermo is off or self-cleaning is performed. * C-Individual air direction setup>- Pushing	No.	Item	Outline of specifications	Remarks
* [SWING] is displayed and the following display is repeated. In all operations * In group twin operation, the louver positions can be set up collectively or individually. 3) When the unit stopped or the warning was output, the louver is automatically set to full closed position. 4) When PRE-HEAT * (Heating ready) is displayed (Heating operation started or defrost operation is performed), heating thermo is off or self-cleaning is performed, the louver is automatically set to horizontal discharge position. * The louver which air direction is individually set or the locked louver closes fully when the unit stops and the louver is automatically set to horizontal discharge position when PRE-HEAT * (Heating ready) is displayed, heating thermo is off or self-cleaning is performed. * In case of no input (key operation) for approx. 5 seconds during setting of individual air direction (during displaying of louver No. on the remote controller screen), the remote controller screen, the remote controller screen), the remote controller screen returns to the normal display screen. * For the air direction illustration during normal operation, the air direction of the least No. among the louvers which are block-set is displayed. * While individual air direction is being set, the remote controller operation (illustration of air direction) and operation of the real machine are linked. * When selecting a case, * * * * * * * * * * * * * * * * * * *	12		 When the louver position is changed, the position moves necessarily to downward discharge position once to return to the set position. The louver position can be set up in the following operation range. In cooling/dry operation In heating/fan operation In group twin/triple operation, the louver positions can be set up collectively or individually. 	position at under SM80 differs from
Refrigerant pipe [04] Drain pipe			Swing setup Swing is displayed and the following display is repeated. In all operations	moves usually up to the ceiling side from the louver position of the set time. Setup from the remote controller without button is unavailable. For the setup operation, refer to "How to set up louver individually" of Item "Setup at local site/ Others". Using same as the present 4-way Air Discharge Cassette

No.	Item		Outline of sp	pecifications	Remarks
12	Louver control	< <selection< td=""><td>of Swing mode>></td><td></td><td></td></selection<>	of Swing mode>>		
	(Continued)	For the Sw selectable	ing mode, the follow and settable by keep	ing three types of modes are bing Swing/Direction Swing/Fix more on the remote controller.	On the remote controller before the wired remote controller
			d (4 pieces: same pl : [0001 (At shipment		(RBC-AMT31E), the mode cannot be moved to the select mode
		horizont		lected, four louvers align at the n and then start the Swing	even if pushing F. button for a long time.
		② Dual sw	ing → Data: [0002	2]	Carry out setting
		and [03] louvers	move to the horizor of louver No. [02] an	the louvers of louver No. [01] ntal discharge position, the d [04] move to the downward start the Swing operation at the	operation during stop of the unit; otherwise the unit stops operation.
		same tir		ciant and chang operation at an	The standard swing performs the same
		_	wing → Data: [0003	•	swing operation as the
		horizont	al discharge position	the louver No. [01] moves to the n, [03] to the downward dis- t] to the middle position and	present operation (2 series).
				on at the same time.	For the setting opera-
		by the setu	p data of Item code	` /	tion, refer to [How to set up type of the swings] in Item "Setup
				mode, "Dual swing" or "Cycle is displayed at the center of the	at local site/Others".
		remote con	troller screen for ap	prox. 3 seconds when swind riv	On the remote control-
			pushed to select [S] for the standard sw		ler before the wired remote controller
		(ito diopidy	ior are startaged on	9)	(RBC-AMT31E),
					flashing showing the Swing mode is not
					indicated.
			Alternate lighting (0.5 sec.)	Alternate lighting (0.5 sec.)	
		Di	ual swing	Cycle swing	
		< <louver lo<="" td=""><td>ck (Louver fix)>></td><td></td><td></td></louver>	ck (Louver fix)>>		
		• For the air	direction setup for e	ach discharge port, the louver	On the remote control-
		1 .	_	he normal operation.	ler before the wired remote controller
		registered 4 seconds	and set by keeping or more on the remo	arbitrary louver can be button pushed for ote controller.	(RBC-AMT31E), ONIT LOUVER button is not
				egistering the setup data to Item g to the following table.	provided. Carry out setting operation during stop
		Item code	Objective louver No.	Setup data	of the unit; otherwise
		F1	01	0000: Release (At shipment)	the unit stops opera-
		F2	02	0001: Horizontal discharge position	
		F3	03	~	
		F4	04	0005: Downward discharge position	

No.	Item		Outline of spec	Remarks	
12	Louver control (Continued)	contro	re is the locked louver in the upler screen. the following controls are perif executing the louver lock.	For the setting operation, refer to [How to set louver lock] of Installation	
			Control which ignores lock	Manual.	
		1	Operation stop	Full-close position	
		2	When heating operation started	Horizontal discharge position	
		3	Heating thermo. OFF	Horizontal discharge position	
		4	During defrost operation	Horizontal discharge position	It is position check
		(5)	Initialize operation	Full-close position	operation and it does
		6	Self-clean operation	Horizontal discharge position	not link with the real louver and air
		direction setup (Illustration on the remote controller screen). If selecting the cold draft-less position, effect of the smudging-less weakens.			
13	HA control	etc, rem 2) This 3) I/O: 4) This term ON mer duri	s control is connected to TV co and start/stop are available by ote position. s control outputs start/stop sta specifications conform to JEM s control outputs [Operation OFI ninal while self-cleaning works. (Operating) signal] is possible to th)] of Item code (DN) [CC] to [Ong self-clean operation during of self-clean operation is not perform	In the group operation, use this control by connecting to either master or follower indoor unit.	
14	Frequency fixed operation (Test run)	1) Whe disp mod 2) Pus 3) Usir • Do • Do • Ar • A 4) Afte (Dis 5) Pus ([TE	e of wired remote controllers en pushing [CHK] button for 4 blayed on the display screen and de. h [ON/OFF] button. Ing [MODE] button, set the mode of not use other mode than [CC uring test run operation, the term of error is detected as usual. frequency fixed operation is pure the test run, push [ON/OFF] play in the display part is sam h [CHK] button to clear the test est of the normal stop status.	Command frequency is approximately [S7]	

No.	Item	Outline of specifications	Remarks		
15	Filter sign display (Except wireless type)	 The operation time of the indoor fan is calculated, the filter reset signal is sent to the remote controller when the specified time (2500H) has passed, and it is displayed on LCD. When the filter reset signal has been received from the remote controller, time of the calculation timer is cleared. In this case, the measurement time is reset if the specified 	[FILTER ▦] goes on.		
		time has passed, and display on LCD disappears.			
16	Central control mode selection	 Setting at the centerl controller side enables to select the contents which can be operated on the remote controller at indoor unit side. 			
		2) Setup contents			
		 64 line central controller (TCB-SC642TLE2) [Individual]: Operated on the remote controller (Priority to second pushing) 	Display at remote controller side (No display)		
		[Central 1]: ON/OFF operation cannot be operated on the remote controller.	[Central 📻] goes on		
		[Central 2]: ON/OFF, mode selection, temp. setup operations cannot be operated on the remote controller.	[Central 👝] goes on		
		[Central 3]: Mode selection and temp. setup operations cannot be operated on the remote controller.	[Central 📻] goes on		
		[Central 4]: Mode selection cannot be operated on the remote controller.	[Central 📻] goes on		
		* In case of the wireless type, the display lamp does not change but the contents are same. If operating an item which is prohibited by the central control mode from the remote controller, it is notified with the receive sound, Pi, Pi, Pi, Pi, Pi (5 times).			
17	Energy-saving control	Selecting [AUTO] mode enables an energy-saving to be operated.			
		 The setup temperature is shifted (corrected) in the range not to lose the comfort ability according to input values of various sensors. 			
		 Data (Input value room temp. Ta, Outside temp. To, Air volume, Indoor heat exchanger sensor temp. Tc) for 20 minutes are taken the average to calculate correction value of the setup temperature. 			
		 The setup temperature is shifted every 20 minutes, and the shifted range is as follows. 			
		In cooling time: +1.5 to - 1.0K In heating time: -1.5 to +1.0K			
18	Max. frequency cut control	This control is operated by selecting [AUTO] operation mode COOL operation mode: It is controlled according to the following figure if To < 28°C. To > 15°C.	node: It is controlled following figure if		
		Ta(°C) Normal control Ta(°C) Normal control Ta(°C) Tsh Max. frequency is restricted to approximately the rated heating frequency Ta(°C) Normal control Ta(°C) Tsh Normal control			

No.	Item		Remarks					
19	DC motor	 When the fan operation has started, positioning of the stator and the rotor are performed. (Moves slightly with tap sound) The motor operates according to the command from the indoor controller. Notes) When the fan rotates while the air conditioner stops due to entering of outside air, etc, the air conditioner may operate while the fan motor stops. When a fan lock is found, the air conditioner stops, and an error is displayed. 						Check code [P12]
20	Self-clean operation (Dry operation)			operation mode rations are perfor		OOL, COOL, [DRY)	stopped, the following
		Compres ON per	ssor iod	Self-clean operation period	FAN	Drain pump		Louver
		0 to 10 r	min.	None				
		10 to 60		1 hour	Fan (UL)	STOP	Hori	zontal discharge position
		60 min.	. to	2 hours				
21	Savo appration	(Green LED) goes off. 3) To stop the self-clean operation, push twice the [ON/OFF] button on the remote controller continuously. (Stop the operation as compressor ON time in the table above: 10 minutes or below.) 4) When the follower unit executes self-clean operation in the group connection, the segment of ⊚ is displayed on the wireless remote controller. * If self-clean operation is not used, set invalidity (does in the controller).						controller before the wired remote controller (RBC-AMT31E), Dry operation display is not output. And it is not also on the wireless remote controller. It is recognized as [STOP] from the remote monitor side.
21	Save operation	 Turn on button on the remote controller. During operation of save operation, blights on the wired remote controller. During save operation, the current release control is performed with the restriction ratio set in EEPROM on the outdoor unit. The restriction ratio can be set by keeping button pushed for 4 seconds or more on the remote controller. When validating the save operation, the next operation starts with save operation valid because contents are held even when operation stops, operation mode changes or power supply is reset. The restriction ratio can be set by changing the setup data of Item code (DN) [C2] in the range of 50 to 100% (every 1%, Setting at shipment: 75%). 					Display is not output on the remote controller before the wired remote controller (RBC-AMT31E). Carry out setting operation during stop of the unit; otherwise the unit stops operation. For the setup operation, refer to "How to set up contents of save operation" of Installation Manual.	

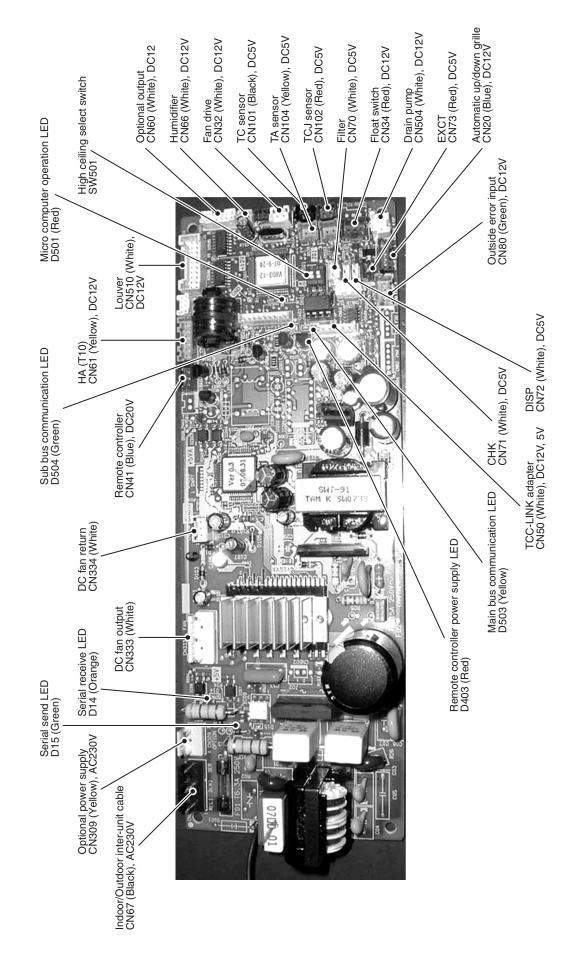
No.	Item	Outline of specifications	Remarks
22	8°C heating/ Frost protective operation	 This functional is intended for the cold latitudes and performs objective heating operation (8°C heating operation). This function is valid only for combination with the outdoor units (Company Birital Inscriptor (CDI) 4 period and the country of the control of the	In a group connection,
		units (Super Digital Inverter (SDI) 4-series outdoor units). 3) Using the indoor DN code [D1] (1 bit), Valid/Invalid of this function is set up at the customer's side.	if there is even one combination with other unit, "This function is not
		 The setup by DN code is Invalid [0]/Valid [1] and Invalid [0] has been set at the shipment. 	provided." is displayed.
		 This operation is the heating operation which sets +8°C as the setup temperature of the target. 	
		5) This function starts operation by pushing temperature button v during heating operation; besides by pushing button for 4 seconds or more after temperature reached the minimum set temperature.	The setup temperature jumps from [18] to [8].
		To stop/release this operation, select and execute one from the following operations.	
		① Push button: Heating operation (18°C setting) continues.	
		 ② Push [START/STOP] button: Air conditioner stops. (Heating 18°C operation at the next start) ③ Push	
		operation continues.	
		 As the setup temperature is +8°C and the human heating is not targeted, the cold air discharge preventive control (Item 7) is made invalid to suppress the intermittent operation. 	
		The settings of the air direction and air volume are changeable during this operation.	
		 The indoor fan stops to protect the compressor for 2 minutes after start of heating operation (Thermo-ON) by this function. 	

Function	Connector No.	Pin No.	Specifications	Remarks						
	ımidifier output (*) CN66		DC12V	Humidifier output is ON when heating operation is performed, when thermostat is on, when the fan is on.						
Humidifier output (*)	CN66	2	Output (Open collector)	* The setting of Humidifier provided + Drain pump ON is performed by short-circuit of CN70 or from the remote controller. (DN [40] = 0001)						
Mantilation autout	0.100	1	DC12V	Setting at shipment: Interlock of ON by indoor unit operation, with OFF by stop operation						
ventilation output	entilation output CN32		Output (Open collector)	* The single operation setting by FAN button on the remote controller is performed on the remote controller (DN [31] = 0000 → 0001)						
		1	ON/OFF input	HA ON/OFF input (J01:YES/NO=Pulse (At shipment from factory) /Static input selection)						
		2	ov							
		3	Remote controller prohibited input	Permission/Prohibition of remote controller operation stop is performed by input.						
HA	CN61	4	Operation output (Open collector)	Operation ON (Answer back of HA)						
		5	DC12V							
		6	Warning output (Open collector)	Warning output ON						
		1	DC12V							
		2	Defrost output (Open collector)	ON when outdoor unit is defrosted						
	CN60	3	Thermostat ON output (Open collector)	ON when real thermostat is on. (Compressor ON)						
Option output		4	Cooling output (Open collector)	ON when operation mode is cooling system (COOL, DRY, Cooling/Heating automatic cooling)						
		5	Heating output (Open collector)	ON when operation mode is heating system (HEAT, Cooling/Heating automatic heating)						
		6	Fan output (Open collector)	ON when indoor fan is on. (When air cleaner is used) OFF while clean operation is performed.						
	CN80	1	DC12V							
Outside error input		CN80	CN80	CN80	CN80	CN80	CN80	CN80	2	NC
·		3	Outside error input							
		1	DC12V							
		2	Panel operation input	The collection and all and a considerable and the collection of th						
AUTO up/down grille	CN20	3	Panel up output (Open collector)	The grille is controlled according to up/down operation from the remote controller. * Setting of automatic up/down grille provided is performed on the remote controller.						
(*)		4	Panel down output (Open collector)	(DN [30] = 0000 → 0001)						
		5	OV							
FILTER		1		Selection of option error input (Protective operation display of device attached to outside) or Humidifier setting input (Vaporizing + Drain pump ON)						
Option error / Humidifier setting (*)	CN70	2	ov	Humidifier is set at shipment from factory. * Setting of option error input is performed on the remote controller. (DN [2A] = 0002 → 0001)						
CHK	0174	1		This check is used to check indoor operation. (Performs operation of indoor fan "H", Louver horizontal						
Operation check	CN71	2	ov	and Drain pump ON without communication with outdoor and remote controller)						
DISP	ON 70	1								
Exhibition mode	CN72	2	OV	Communication is available by indoor unit and remote controller only.						
EXCT	ON 70	1	Demand input	hadroner's formed the second of OFF annual to						
Demand	CN73	2	ov	Indoor unit forced thermostat OFF operation						

 $[\]ast$ This option is not provided to oversea models.

7-4. Indoor Print Circuit Board

<MCC-1570>



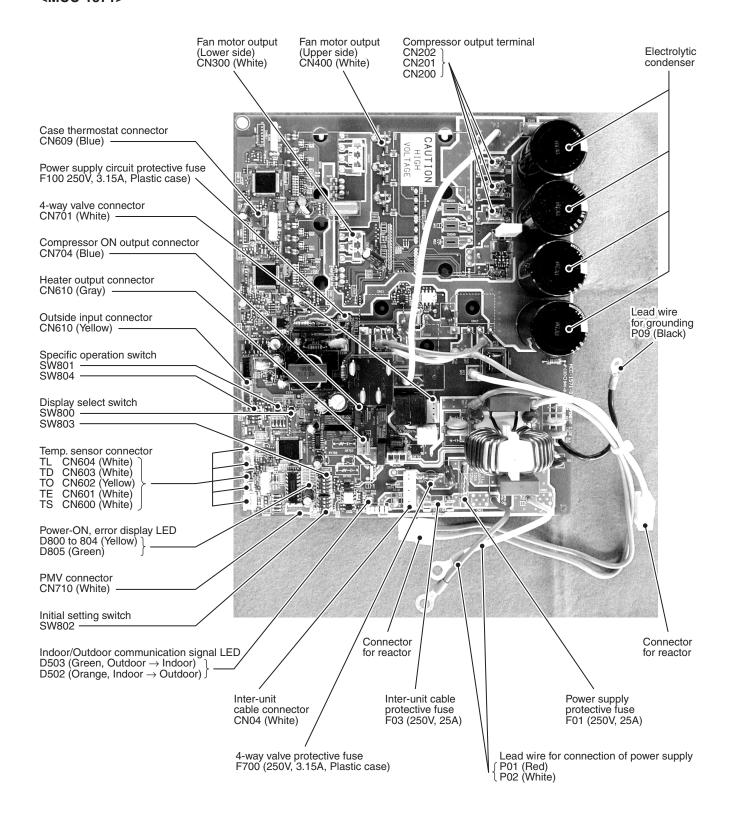
8. CIRCUIT CONFIGURATION AND CONTROL SPECIFICATIONS

8-1. Outdoor Controls

8-1-1. Print Circuit Board

<Viewed from parts of P.C board>
RAV-SP1104AT-E, RAV-SP1404AT-E
RAV-SP1104ATZ-E, RAV-SP1404ATZ-E
RAV-SP1104ATZG-E, RAV-SP1404ATZG-E

<MCC-1571>



8-2. Outline of Main Controls

1. PMV (Pulse Motor Valve) control

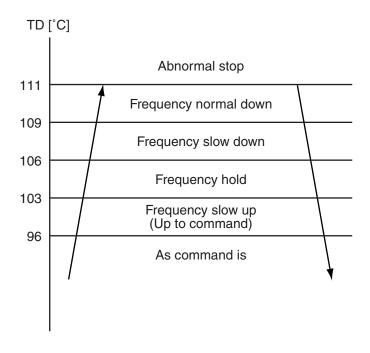
- 1) PMV is controlled between 30 and 500 pulsed during operation.
- 2) In cooling operation, PMV is usually controlled with the temperature difference between TS sensor and TC sensor aiming 1 to 4K as the target value.
- 3) In heating operation, PMV is usually controlled with the temperature difference between TS sensor and TE sensor aiming –1 to 4K as the target value.
- 4) When the cycle excessively heated in both cooling and heating operation, PMV is controlled by TD sensor. The target value is usually 91°C in cooling operation and 96°C in heating operation.

REQUIREMENT

A sensor trouble may cause a liquid back-flow or abnormal overheat resulting in excessive shortening of the compressor life. In a case of trouble on the compressor, be sure to check there is no error in the resistance value or the refrigerating cycle of each sensor after repair and then start the operation.

2. Discharge temperature release control

- 1) When the discharge temperature did not fall or the discharge temperature rapidly went up by PMV control, this control lowers the operation frequency. It subdivides the frequency control up to 0.6Hz to stabilize the cycle.
- 2) When the discharge temperature detected an abnormal stop zone, the compressor stops and then restarts after 2 minutes 30 seconds.
 - The error counting is cleared when the operation continued for 10 minutes. If the error is detected by 4 times without clearing, the error is determined and restarting is not performed.
 - * The cause is considered as excessively little amount of refrigerant, PMV error or clogging of the cycle.
- 3) For displayed contents of error, confirm on the check code list.



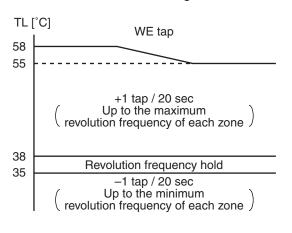
3. Outdoor fan control

Revolution frequency allocation of fan taps [rpm]

		W1	W2	W3	W4	W5	W6	W7	W8	W9	WA	WB	WC	WD	WE
SP110	Up	200	240	240	260	320	380	480	500	530	610	640	660	720	780
SP140	Down	_	_	200	280	360	400	500	520	550	630	660	700	740	820

3-1) Cooling fan control

- ① The outdoor fan is controlled by TL sensor, TO sensor and the operation frequency. The outdoor fan is controlled by every 1 tap of DC fan control (14 taps).
- ② Only for 60 seconds after the operation has started, the maximum fan tap corresponding to the zone in the following table is fixed and then the fan is controlled by temperature of TL sensor.

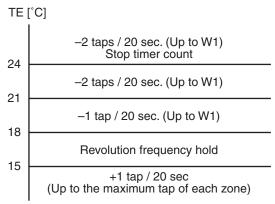


Temp. range		Hz ower		Hz 5Hz	45Hz or higher	
	Min.	Max.	Min.	Max.	Min.	Max.
38°C ≤ TO	W6	WC	W8	WC	WA	WD
29°C ≤ TO < 38°C	W5	WB	W7	WC*	W9	WC
15°C ≤ TO < 29°C	W4	W8	W6	WA	W8	WC
5°C ≤ TO < 15°C	W3	W6	W5	W8	W7	WA
0°C ≤ TO < 5°C	W2	W4	W4	W6	W5	W8
-4°C ≤ TO < 0°C	W2	W3	W3	W5	W4	W6
TO < -4°C	W1	W2	W1	W4	W2	W6
TO error	W1	WC	W1	WC	W2	WD

*: WB for SP110

3-2) Heating fan control

- ① The outdoor fan is controlled by TE sensor, TO sensor and the operation frequency. (Control from minimum W1 to maximum (according to the following table))
- ② For 3 minutes after the operation has started, the maximum fan tap corresponding to the zone in the following table is fixed and then the fan is controlled by temperature of TE sensor.



③ When TE ≥ 24°C continues for 5 minutes, the compressor stops. It is the same status as the normal thermostat-OFF without error display. The compressor restarts after approx. 2 minutes 30 seconds and

this intermittent operation is not abnormal.

④ In case that the status in item ③ generates frequently, stain on filter of the suction part of the indoor unit is considered. Clean the filter and then restart the operation.

Object: SP110

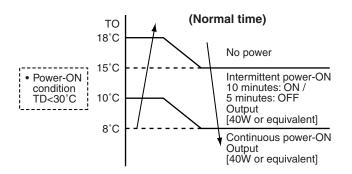
Object: SP140

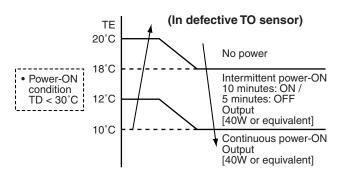
Temp. range	20 Hz or lower	20Hz to 45Hz	45Hz or higher
	Max.	Max.	Max.
10°C ≤ TO	W7	W8	W9
5°C ≤ TO < 10°C	W9	WA	WB
-3°C ≤ TO < 5°C	WB	WB	WC
-10°C ≤ TO < -3°C	WC	WC	WC
TO < -10°C	WD	WD	WD
TO error	WD	WD	WD

20 Hz 20Hz 45Hz to 45Hz or lower or higher Temp. range Max. Max. Max. 10°C ≤ TO W7 W8 W9 5°C ≤ TO < 10°C W9 WA WA $-3^{\circ}C \leq TO < 5^{\circ}C$ WB WA WA -10°C ≤ TO < -3°C **WB WB WB** TO < -10°C WD WD WD TO error WD WD WD

4. Coil heating control

- 1) This control function heats the compressor by turning on the stopped compressor instead of a case heater. It purposes to prevent stagnation of the refrigerant inside of the compressor.
- 2) As usual, turn on power of the compressor for the specified time before a test run after installation; otherwise a trouble of the compressor may be caused.
 - As same as a test run, it is recommended to turn on power of the compressor beforehand when starting operation after power of the compressor has been interrupted and left as it is for a long time.
- 3) A judgment for electricity is performed by TD and TO sensors.
 - If TO sensor is defective, a backup control is automatically performed by TE sensor.
 - For a case of defective TO sensor, judge it with outdoor LED display.
- 4) For every model, the power is turned off when TD is 30°C or more.





REQUIREMENT

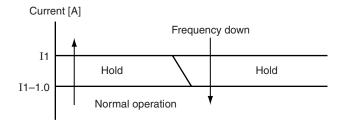
While heating the coil, the power sound may be heard. However it is not a trouble.

5. Short intermittent operation preventive control

- 1) For 3 to 10 minutes after operation start, in some cases, the compressor does not stop to protect the compressor even if receiving the thermostat-OFF signal from indoor. However it is not abnormal status. (The operation continuance differs according to the operation status.)
- 2) When the operation stops by the remote controller, the operation does not continue.

6. Current release control

No. of revolutions of the compressor is controlled by AC current value detected by T620 on the outdoor P.C. board so that the input current of the inverter does not exceed the specified value.



Objective model	SP110 / SP140				
Objective model	COOL	HEAT			
I1 value [A]	20.0	20.0			

7. Current release value shift control

- This control purposes to prevent troubles of the electronic parts such as the compressor driving elements and the compressor during cooling operation.
- The current release control value (I1) is selected from the following table according to TO sensor value.

Current release control value (I1)

[A]

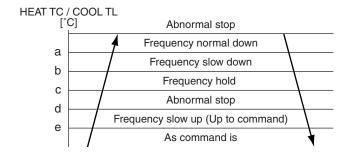
Temperature range	SP110, SP140
44°C ≤ To	15.0
39°C ≤ To < 44°C	17.7
To < 39°C	20.0
TO error	15.0

8. Over-current protective control

- 1) When the over-current protective circuit detected an abnormal current, stop the compressor.
- 2) The compressor restarts after 2 minutes 30 seconds setting [1] as an error count.
- 3) When the error count [8] was found, determine an error and restart operation is not performed.
- 4) For the error display contents, confirm on the check code list.

9. High-pressure release control

- 1) The operation frequency is controlled to restrain abnormal rising of high pressure by TL sensor in cooling operation and TC sensor in heating operation.
- 2) When TL sensor in cooling operation or TC sensor in heating operation detects abnormal temperature of the stop zone, stop the compressor and the error count becomes +1.
- 3) When the compressor stopped with 2), the operation restarts from the point of the normal operation zone (e point or lower) where it returned after 2 minutes 30 seconds.
- 4) The error count when the compressor stopped with 2) is cleared after the operation continued for 10 minutes. If the error count becomes [10] without clearing, the error is determined and reactivation is not performed.
- 5) For the error display contents, confirm on the check code list.

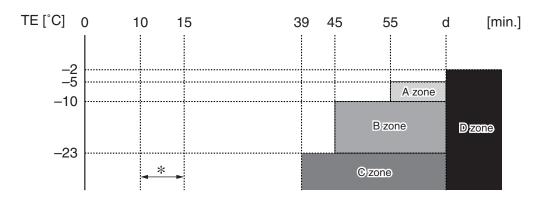


	HEAT	COOL
	TC	TL
а	62°C	63°C
b	57°C	62°C
С	55°C	60°C
d	53°C	58°C
е	49°C	54°C

10. Defrost control

- 1) In heating operation, defrost operation is performed when TE sensor satisfies any condition in A zone to D zone.
- 2) During defrosting operation, it finishes if TE sensor continued 12° C or higher for 3 seconds or continued 7° C \leq TE < 12° C for 1 minute.
 - The defrost operation also finishes when it continued for 10 minutes even if TE sensor temperature was 7°C or lower.
- 3) After defrost operation was reset, the compressor stopped for approx. 40 seconds and then the heating operation starts.

Start of heating operation



* The minimum TE value and To value between 10 and 15 minutes after heating operation has started are stored in memory as TE0 and To0, respectively.

	In normal To	In abnormal To			
A zone	When status (TE0 – TE) – (To0 – To) ≥ 3°C continued for 20 seconds	When status (TE0 – TE) ≥ 3°C continued for 20 seconds			
B zone	When status (TE0 – TE) – (To0 – To) ≥ 2°C continued for 20 seconds	When status (TE0 – TE) ≥ 2°C continued for 20 seconds			
C zone	When status (TE ≤ −23°C) continued for 20 seconds				
D zone	When compressor operation status of TE < -2° C is calculated by d portion				

 The time of above d can be changed by exchanging jumper [J805] and [J806] of the outdoor control P.C. board. (Setting at shipment: 150 minutes)

J805	J806	d
0	0	150 minutes Setting at shipment
0	×	90 minutes
×	0	60 minutes
×	×	30 minutes

○ : Short circuit, X : Open

9. TROUBLESHOOTING

9-1. Summary of Troubleshooting

<Wired remote controller type>

1. Before troubleshooting

- 1) Required tools/instruments
 - \oplus and \bigcirc screwdrivers, spanners, radio cutting pliers, nippers, push pins for reset switch
 - Tester, thermometer, pressure gauge, etc.
- 2) Confirmation points before check
 - a) The following operations are normal.
 - 1. Compressor does not operate.
 - Is not 3-minutes delay (3 minutes after compressor OFF)?
 - Is not the outdoor unit in standby status though the remote controller reached the setup temperature?
 - Does not timer operate during fan operation?
 - Is not an overflow error detected on the indoor unit?
 - Is not outside high-temperature operation controlled in heating operation?
 - 2. Indoor fan does not rotate.
 - Does not cool air discharge preventive control work in heating operation?
 - 3. Outdoor fan does not rotate or air volume changes.
 - Does not high-temperature release operation control work in heating operation?
 - Does not outside low-temperature operation control work in cooling operation?
 - Is not defrost operation performed?
 - 4. ON/OFF operation cannot be performed from remote controller.
 - Is not the control operation performed from outside/remote side?
 - Is not automatic address being set up?
 (When the power is turned on at the first time or when indoor unit address setting is changed, the operation cannot be performed for maximum approx. 5 minutes after power-ON.)
 - Is not being carried out a test run by operation of the outdoor controller?
 - b) Did you return the cabling to the initial positions?
 - c) Are connecting cables of indoor unit and remote controller correct?

2. Troubleshooting procedure

When a trouble occurred, check the parts along with the following procedure.



NOTE:

For cause of a trouble, power conditions or malfunction/erroneous diagnosis of microcomputer due to outer noise is considered except the items to be checked. If there is any noise source, change the cables of the remote controller to shield cables.

<Wireless remote controller type>

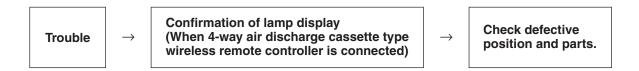
1. Before troubleshooting

- 1) Required tools/instruments
 - (+) and (-) screwdrivers, spanners, radio cutting pliers, nippers, etc.
 - Tester, thermometer, pressure gauge, etc.
- 2) Confirmation points before check
 - a) The following operations are normal.
 - 1. Compressor does not operate.
 - Is not 3-minutes delay (3 minutes after compressor OFF)?
 - Is not the outdoor unit in standby status though the remote controller reached the setup temperature?
 - Does not timer operate during fan operation?
 - Is not an overflow error detected on the indoor unit?
 - Is not outside high-temperature operation controlled in heating operation?
 - 2. Indoor fan does not rotate.
 - Does not cool air discharge preventive control work in heating operation?
- 3) Outdoor fan does not rotate or air volume changes.
 - Does not high-temperature release operation control work in heating operation?
 - Does not outside low-temperature operation control work in cooling operation?
 - Is not defrost operation performed?
- 4) ON/OFF operation cannot be performed from remote controller.
 - Is not forced operation performed?
 - Is not the control operation performed from outside/remote side?
 - Is not automatic address being set up?
 - Is not being carried out a test run by operation of the outdoor controller?
 - a) Did you return the cabling to the initial positions?
 - b) Are connecting cables between indoor unit and receiving unit correct?

2. Troubleshooting procedure

(When the power is turned on at the first time or when indoor unit address setting is changed, the operation cannot be performed for maximum approx. 5 minutes after power-ON.)

When a trouble occurred, check the parts along with the following procedure.



1) Outline of judgment

The primary judgment to check where a trouble occurred in indoor unit or outdoor unit is performed with the following method.

Method to judge the erroneous position by flashing indication on the display part of indoor unit (sensors of the receiving unit)

The indoor unit monitors operating status of the air conditioner, and the blocked contents of self-diagnosis are displayed restricted to the following cases if a protective circuit works.

9-2. Troubleshooting

9-2-1. Outline of judgment

The primary judgment to check whether a trouble occurred in the indoor unit or outdoor unit is carried out with the following method.

Method to judge the erroneous position by flashing indication on the display part of the indoor unit (sensors of the receiving part)

The indoor unit monitors the operating status of the air conditioner, and the blocked contents of self-diagnosis are displayed restricted to the following cases if a protective circuit works.

● : Go off, ○ : Go on, -ं∴ : Flash (0.5 sec.)

Lam	p indicat	ion	Check code	Cause of trouble occurrence			
•	Operation Timer Ready No indication at all			Power supply OFF or miswiring between receiving unit and indoor unit			
			E01	Receiving error Receiving unit			
			E02	Sending error Miswiring or wire connection error between receiving unit and indoor unit			
Operation	Timer	Ready	E03	Communication stop			
1 ' .	Tilliei	ricauy	E08	Duplicated indoor unit No. Setup error			
-\(\)- Flash			E09	Duplicated master units of remote controller			
1 18311			E10	Communication error between CPUs on indoor unit P.C. board			
			E18	Wire connection error between indoor units, Indoor power OFF (Communication stop between indoor master and follower or between main and sub indoor twin)			
Operation	Timer	Ready					
•		->-	E04	Miswiring between indoor unit and outdoor unit or connection erorr (Communication stop between indoor and outdoor units)			
		Flash					
Operation	Timer	Ready	Overflow was detected	Overflow was detected. Protective device of indoor unit worked.			
	Alterna		P12	Indoor DC fan error			
			P03	Outdoor unit discharge temp. error Protective device of *1			
			P04	Outdoor high pressure system error outdoor unit worked.			
			P05	Negative phase detection error			
			P07	Heat sink overheat error Outdoor unit error			
Operation	Timer	Ready	P15	Gas leak detection error			
- ` Ö-		-)(-	P19	4-way valve system error (Indoor or outdoor unit judged.)			
Alte	rnate fla	sh	P20	Outdoor unit high pressure protection			
			P22	Outdoor unit: Outdoor unit error			
		Р	P26	Outdoor unit: Inverter Idc operation Protective device of outdoor unit worked *1			
			P29	Outdoor unit: Position detection error			
			P31	Stopped because of error of other indoor unit in a group (Check codes of E03/L03/L07/L08)			

^{*1:} These are representative examples and the check code differs according to the outdoor unit to be combined.

Lamp indication	Check code	Cause of troub	ole occurrence		
Operation Timer Ready	F01	Heat exchanger sensor (TCJ) error			
	F02	Heat exchanger sensor (TC) error	Indoor unit sensor error		
Alternate flash	P10	Heat exchanger sensor (TA) error			
	F04				
	F06	Discharge temp. sensor (TD) error			
Operation Timer Ready	F07	Temp. sensor (TE) error Temp. sensor (TL) error			
	F08	Temp. sensor (TO) error	Sensor error of outdoor unit *1		
Alternate flash	F12	Temp. sensor (TS) error Temp. sensor (TH) error			
	F13	Temp. Sensor miswiring (TE, TS)			
	F15				
Operation Timer Ready	F29	Indoor EEPROM error			
Operation Timer Ready	F31	Outdoor EEPROM error			
	H01	Compressor break down Compressor lock Current detection circuit error Case thermostat worked. Outdoor unit low pressure system error			
Operation Timer Ready	H02				
• -\\\ -	H03		door compressor system error *1		
Flash	H04				
	H06	processing of the state of the			
	L03	Duplicated master indoor units			
Operation Timer Ready	L07	There is indoor unit of group connection in individual indoor unit.	* If group construction and		
Simultaneous flash	L08	Unsetting of group address Missed setting (Unset indoor capacity)	address are not normal when power supply turned on, automatically goes to address		
Girianariesas nasir	L09		setup mode.		
	L10				
Operation Timer Ready	L20	Unset model type (Service board) Duplicated indoor central addresses			
	L29	Outdoor unit and other error	Others		
Simultaneous flash	L30	Outside interlock error Negative phase error			
	L31	Trogativo pridociónos			

^{*1:} These are representative examples and the check code differs according to the outdoor unit to be combined.

9-2-2. Others (Other than Check Code)

Lamp indication			Check code	Cause of trouble occurrence
Operation Simul	Timer -\(\tilde{-}\)- taneous	Ready -\o'- flash	_	During test run
Operation	-)-	Ready 	П	Disagreement of cool/heat (Automatic cool/heat setting to automatic cool/heat prohibited model, or setting of heating to cooling-only model)

9-2-3. Check Code List (Indoor)

O: Go on, @: Flash, •: Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

(Indoor unit detected)

Check code indication	Sen	sor lamp	indicat	ion			Air condition	ner operation
TCC-LINK central &		Block ind	lication		Representative defective position	Explanation of error contents	Automatic	Operation
Wired remote controller	Operation	Operation Timer Ready Flash					reset	continuation
E03	0	•	•		Regular communication error between indoor and remote controller	No communication from remote controller and network adapter (Also no communication from central control system)	0	×
E04	•	•	0		Indoor/Outdoor serial error	There is error on serial communication between indoor and outdoor units	0	×
E08	0	•	•		Duplicated indoor addresses	Same address as yours was detected.	0	×
E10	0	•	•		Communication error between indoor MCU	MCU communication error between main motor and micro computer	0	×
E18	0	•	•		Regular communication error between indoor master and follower units	Regular communication between indoor master and follower units is impossible, Communication between twin master (main) and follower (sub) units is impossible.	0	×
F01	0	0	•	ALT	Indoor unit, Heat exchanger (TCJ) error	Open/short was detected on heat exchanger (TCJ).	0	×
F02	0	0	•	ALT	Indoor unit, Heat exchanger (TC) error	Open/short was detected on heat exchanger (TC).	0	×
F10	0	0	•	ALT	Indoor unit, Room temp. sensor (TA) error	Open/short was detected on room temp. sensor (TA).	0	×
F29	0	0	•	SIM	Indoor unit, other indoor P.C. board error	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
L03	0	•	0	SIM	Duplicated setting of indoor group master unit <	There are multiple master units in a group.	×	×
L07	0	•	0	SIM	There is group cable in individual indoor unit.	When even one group connection indoor unit exists in individual indoor unit.	×	×
L08	0	•	0	SIM	Unset indoor group address	Indoor group address is unset.	×	×
L09	0	•	0	SIM	Unset indoor capacity	Capacity of indoor unit is unset.	×	×
L20	0	0	0	SIM	Duplicated central control system address	Duplicated setting of central control system address	0	×
L30	0	0	0	SIM	Outside error input to indoor unit (Interlock)	Abnormal stop by outside error (CN80) input	×	×
P01		0	0	ALT	Indoor unit, AC fan error	An error of indoor AC fan was detected. (Fan motor thermal relay worked.)	×	×
P10		0	0	ALT	Indoor unit, overflow detection	Float switch worked.	×	×
P12		0	0	ALT	Indoor unit, DC fan error	Indoor DC fan error (Over-current/Lock, etc.) was detected.	×	×
P19	0	•	0	ALT	4-way valve system error	In heating operation, an error was detected by temp. down of indoor heat exchanger sensor.	0	×
P31	0	•	0	ALT	Other indoor unit error	Follower unit in group cannot operate by warning from [E03/L03/L07/L08] of master unit.	0	×

When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

(Remote controller detected)

Check code indication	Sensor lamp indication		Sensor lamp indication				Air condition	ner operation
Wired remote controller	Block indication				Representative defective position	Explanation of error contents	Automatic	Operation
	Operation Timer Ready Fla		Flash				continuation	
E01	0	•	•		No master remote controller, Remote controller communication (Receive) error	Signal cannot be received from indoor unit. Master remote controller was not set. (including 2 remote controllers)	_	_
E02	0				Remote controller communication (Send) error	Signal cannot be sent to indoor unit.	_	_
E09	0	•	•		Duplicated master remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	Δ

(Central control devices detected)

Check code indication	Sensor lamp indication			Air conditioner operation	
TOO LINK	Block indication	Representative defective position	Explanation of error contents	Automatic	Operation
TCC-LINK central	Operation Timer Ready Flash			reset	continuation
C05	Is not displayed. (Common use of	Central control system communication (send) error	Signal sending operation of central control system is impossible. There are multiple same central devices. (Al-NET)	_	_
C06	remote controller, etc.)	Central control system communication (receive) error	Signal receiving operation of central control system is impossible.	_	_
C12	_	General-purpose device control interface batched warning	An error on device connected to general-purpose device control interface of exclusive to TCC-LINK/AI-NET	_	_
P30	By warning unit (Above-mentioned)	Group follower unit is defective.	Group follower unit is defective. (For remote controller, above-mentioned [***] details are displayed with unit No.	_	

NOTE: Even for the same contents of error such as communication error, the display of check code may differ according to detection device.

When remote controller or central controller detects an error, it is not necessarily related to operation of the air conditioner. In this list, the check codes that outdoor unit detects are not described.

Check Code List (Outdoor)

○ : Go on, ⊚ : Flash, ● : Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

Remote		Sensor la	mp part					Automatic	Operation
controller indication		Block in			Representative defective position	Detection	Explanation of error contents	reset	continuation
			Ready	Flash	O H (TD)	0.11	One (Ohead of Fraheum Lawrence and Alasted		
F04	<u> </u>	<u> </u>	0	ALT	Outdoor unit Discharge temp. sensor (TD) error	Outdoor	Open/Short of discharge temp. sensor was detected.	X	X
F06	0	0	0	ALT	Outdoor unit Temp. sensor (TE, TS, TL) error	Outdoor	Open/Short of heat exchanger temp. sensor was detected. Miswiring between TE sensor and TS sensor	×	×
F08	0	0	0	ALT	Outdoor unit Outside temp. sensor (TO) error	Outdoor	Open/Short of outside temp. sensor was detected.	0	0
F07	0	0	0	ALT	Outdoor unit Temp. sensor (TL) error	Outdoor	Open/Short of heat exchanger temp. sensor was detected.	×	×
F12	0	0	0	ALT	Outdoor unit Temp. sensor (TS) error	Outdoor	Open/Short of suction temp. sensor was detected.	×	×
F13	0	0	0	ALT	Outdoor unit Temp. sensor (TH) error	Outdoor	Open/Short of heat sink temp. sensor (Board installed) was detected.	×	×
F15	0	0	0	ALT	Outdoor unit Misconnection of temp. sensor (TE, TS)	Outdoor	Misconnection of outdoor heat exchanger temp. sensor and suction temp. sensor was detected.	×	×
F31	©	0	0	SIM	Outdoor unit EEPROM error	Outdoor	Outdoor P.C. board part (EEPROM) error was detected.	×	×
H01	•	0	•		Outdoor unit Compressor break down	Outdoor	When reached min-Hz by current release control, short-circuited current (ldc) after DC excitation was detected.	×	×
H02		0	•		Outdoor unit Compressor lock	Outdoor	Compressor lock was detected.	×	×
H03	•	0	•		Outdoor unit Current detection circuit error	Outdoor	Current detection circuit error	×	×
H04		0			Outdoor unit Case thermostat operation	Outdoor	Case thermostat operation was detected.	×	×
L10	0	0	0	SIM	Outdoor unit Setting error of service P.C. board type	Outdoor	When outdoor service P.C. board was used, model type select jumper setting was inappropriate.	×	×
L29	0	0	0	SIM	Outdoor unit Other outdoor unit error	Outdoor	Defective parts on outdoor P.C. board (MCU communication, EEPROM, TH sensor error) When outdoor service P.C. board was used, model type selection was inappropriate. Other error (Heat sink abnormal overheat, gas leak, 4-way valve inverse error) was detected.	×	×
P03	0	•	0	ALT	Outdoor unit Discharge temp. error	Outdoor	Error was detected by discharge temp. release control.	×	×
P04	0	•	0	ALT	Outdoor unit High pressure system error, Power supply voltage error	Outdoor	When case thermostat worked, error was detected by high release control from indoor/ outdoor heat exchanger temp. sensor. Power supply voltage error	×	×
P05	0	•	0	ALT	Power supply error	Outdoor	Power supply voltage error	×	×
P07	0	•	0	ALT	Outdoor unit Heat sink overheat	Outdoor	Abnormal overheat was detected by outdoor heat sink temp. sensor.	×	×
P15	0	•	0	ALT	Gas leak detection	Outdoor	Abnormal overheat of discharge temp. or suction temp. was detected.	×	×
P20	0	•	0	ALT	Outdoor unit High pressure system error	Outdoor	Error was detected by high release control from indoor/outdoor heat exchanger temp. sensor.	×	×
P22	0	•	0	ALT	Outdoor unit Outdoor fan error	Outdoor	Error (Over-current, lock, etc.) was detected on outdoor fan drive circuit.	×	×
P26	0	•	0	ALT	Outdoor unit Inverter Idc operation	Outdoor	Short-circuited protective operation of compressor drive circuit element (G-Tr /IGBT) worked.	×	×
P29	0		0	ALT	Outdoor unit Position detection error	Outdoor	Position detection error of compressor motor was detected.	×	×
E01	0	•	•		No remote controller master unit Remote controller communication error	Remote controller	Signal was not received from indoor unit. Main remote controller was not set. (including 2 remote controllers)	_	_
E02	0	•	•		Remote controller send error	Remote controller	Signal cannot be sent to indoor unit.	_	_
E03	0	•	•		Regular communication error between indoor and remote controller	Indoor	No communication from remote controller and network adapter	0	×
E04	•	•	0		Indoor/Outdoor serial error	Indoor	Serial communication error between indoor and outdoor	0	×
E08	0				Duplicated indoor addresses	Indoor	Same address as yours was detected.	0	
E09	0	•	•		Duplicated main remote controllers	Remote controller	In 2-remote controller control, both were set as master. (Indoor master unit stops warning and follower unit continues operation.)	×	×
E10	0	•	•		Communication error between CPU	Indoor	MCU communication error between main motor and micro computer	0	Δ
E18	0	•	•		Regular communication error between master and follower indoor units	Indoor	Regular communication was impossible between master and follower indoor units. Communication between twin master (Main unit) and follower (sub unit) was impossible.	0	×
L03	0	•	0	SIM	Duplicated indoor master units <	Indoor	There are multiple master units in a group.	×	×
L07	0	•	<u></u>	SIM	There is group cable in individual indoor unit.	Indoor	When even one group connection indoor unit exists in individual indoor unit	×	×
L08	0	•	0	SIM	Unset indoor group address ♦	Indoor	Indoor address group was unset.	×	×
L09	0	•	0	SIM	Unset indoor capacity	Indoor	Capacity of indoor unit was unset.	×	×
L30	0	0	0	SIM	Outside error input to indoor unit (Interlock)	Indoor	Abnormal stop by CN80 outside error input	×	×
P19	0	•	0	ALT	4-way valve inverse error	Indoor Outdoor	In heating operation, error was detected by temp. down of indoor heat exchanger or temp. up ofTE, TS.	0	×

When this warning was detected before group construction/address check finish at power supply was turned on, the mode shifts automatically to AUTO address setup mode.

○ : Go on, ⑤ : Flash, ⑥ : Go off ALT (Alternate): Alternate flashing when there are two flashing LED SIM (Simultaneous): Simultaneous flashing when there are two flashing LED

Remote		Sensor la	amp part					A t t ! .	0
controller	ontroller Block indication			Representative defective position	Detection	Explanation of error contents	Automatic reset	Operation continuation	
indication	Operation	on Timer	Ready	Flash					
F01	0	0		ALT	Indoor unit Heat exchanger sensor (TCJ) error	Indoor	Open/Short of heat exchanger (TCJ) was detected.	0	×
F02	0	0		ALT	Indoor unit Heat exchanger sensor (TC) error	Indoor	Open/Short of heat exchanger (TC) was detected.	0	×
F10	0	0		ALT	Indoor unit Room temp. sensor (TA) error	Indoor	Open/Short of room temp. (TA) was detected.	0	×
F29	0	0	•	SIM	Indoor unit Other indoor P.C. board error	Indoor	EEPROM error (Other error may be detected. If no error, automatic address is repeated.	×	×
P01	•	0	0	ALT	Indoor unit Indoor fan error	Indoor	Indoor AC fan error was detected. (Fan thermal relay worked.)		×
P10		0	0	ALT	Indoor unit Overflow detection	Indoor	Float switch worked.		×
P12	•	0	0	ALT	Indoor unit Indoor fan error	Indoor	Indoor fan error (Over-current / Lock, etc.) was detected.		×
P31	0	•	0	ALT	Other indoor unit error	Indoor	Other indoor under condition of warning in group. E03/L07/L03/L08 warning		×
_	By un	it with war	ning No.	ALT	Error in indoor group	Network adapter	Sub remote controller error in a group (Details of remote controller are displayed with unit No. Only central control side is displayed.)	_	_
_		_			LAN system communication error	Network adapter/ Center	Communication error of central control system signal * Is not displayed on the remote controller	0	0
L20	0	0	0	SIM	LAN system communication error	Network adapter/ Center	Duplicated indoor address of central control system communication	0	×
_		_			There are multiple communication adapters.	Network adapter	There are multiple communication adapters on remote controller communication line.	0	0

Error mode detected by indoor unit

	Operation of diagnostic	c function		
Check code	Cause of operation	Status of air conditioner	Condition	Judgment and measures
E03	No communication from remote controller (including wireless) and communication adapter	Stop (Automatic reset)	Displayed when error is detected	Check cables of remote controller and communication adapters. Remote controller LCD display OFF (Disconnection) Central remote controller [97] check code
E04	The serial signal is not output from outdoor unit to indoor unit. Miswiring of inter-unit wire Defective serial sending circuit on outdoor P.C. board Defective serial receiving circuit on indoor P.C. board	Stop (Automatic reset)	Displayed when error is detected	Outdoor unit does not completely operate. Inter-unit wire check, correction of miswiring Check outdoor P.C. board. Correct wiring of P.C. board. When outdoor unit normally operates Check P.C. board (Indoor receiving / Outdoor sending).
E08	Duplicated indoor unit address			Check whether remote controller connection (Group/Individual) was changed or not after power supply turned on
L03	Duplicated indoor master unit		Displayed when	was changed or not after power supply turned on (Finish of group construction/Address check).
L07	There is group wire in individual indoor unit.	Stop	error is detected	* If group construction and address are not normal when the power has been turned on, the mode automatically shifts to address setup mode. (Resetting of address)
L08	Unset indoor group address			
L09	Unset indoor capacity	Stop	Displayed when error is detected	Set indoor capacity (DN=11)
L30	Abnormal input of outside interlock	Stop	Displayed when error is detected	Check outside devices. Check indoor P.C. board.
P10	Float switch operation • Float circuit, Disconnection, Coming-off, Float switch contact error	Stop	Displayed when error is detected	Trouble of drain pump Clogging of drain pump Check float switch. Check indoor P.C. board.
P12	Indoor DC fan error	Stop	Displayed when error is detected	Position detection error Over-current protective circuit of indoor fan driving unit operated. Indoor fan locked. Check indoor P.C. board.
P19	4-way valve system error After heating operation has started, indoor heat exchangers temp. is down.	Stop (Automatic reset)	Displayed when error is detected	Check 4-way valve. Check 2-way valve and check valve. Check indoor heat exchanger (TC/TCJ). Check indoor P.C. board.
P31	Own unit stops while warning is output to other indoor units.	Stop (Follower unit) (Automatic reset)	Displayed when error is detected	Judge follower unit while master unit is [E03], [L03], [L07] or [L08]. Check indoor P.C. board.
F01	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TCJ)	Stop (Automatic reset)	Displayed when error is detected	Check indoor heat exchanger temp. sensor (TCJ). Check indoor P.C. board.
F02	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TC)	Stop (Automatic reset)	Displayed when error is detected	Check indoor heat exchanger temp. sensor (TC). Check indoor P.C. board.
F10	Coming-off, disconnection or short of indoor heat exchanger temp. sensor (TA)	Stop (Automatic reset)	Displayed when error is detected	Check indoor heat exchanger temp. sensor (TA). Check indoor P.C. board.
F29	Indoor EEPROM error • EEPROM access error	Stop (Automatic reset)	Displayed when error is detected	Check indoor EEPROM. (including socket insertion) Check indoor P.C. board.
E10	Communication error between indoor MCU Communication error between fan driving MCU and main MCU	Stop (Automatic reset)	Displayed when error is detected	1. Check indoor P.C. board.
E18	Regular communication error between indoor aster and follower units and between main and sub units	Stop (Automatic reset)	Displayed when error is detected	Check remote controller wiring. Check indoor power supply wiring. Check indoor P.C. board.

Error mode detected by remote controller or central controller (TCC-LINK)

	Operation of diagnostic fur			
Check code	Cause of operation	Status of air conditioner	Condition	Judgment and measures
Not displayed at all (Operation on remote controller is impossible.)	No communication with master indoor unit Remote controller wiring is not correct. Power of indoor unit is not turned on. Automatic address cannot be completed.	Stop	_	Power supply error of remote controller, Indoor EEPROM error 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board. 5. Check indoor EEPROM. (including socket insertion) → Automatic address repeating phenomenon generates.
E01 *2	No communication with master indoor unit Disconnection of inter-unit wire between remote controller and master indoor unit (Detected by remote controller side)	Stop (Automatic reset) * If center exists, operation continues.	Displayed when error is detected	Receiving error from remote controller 1. Check remote controller inter-unit wiring. 2. Check remote controller. 3. Check indoor power wiring. 4. Check indoor P.C. board.
E02	Signal send error to indoor unit (Detected by remote controller side)	Stop (Automatic reset) * If center exists, operation continues.	Displayed when error is detected	Sending error of remote controller 1. Check sending circuit inside of remote controller. → Replace remote controller.
E09	There are multiple main remote controllers. (Detected by remote controller side)	Stop (Sub unit continues operation.)	Displayed when error is detected	In 2-remote controllers (including wireless), there are multiple main units. Check that there are 1 main remote controller and other sub remote controllers.
L20 Central controller L20	Duplicated indoor central addresses on communication of central control system (Detected by indoor/central controller side)	Stop (Automatic reset)	Displayed when error is detected	Check setting of central control system network address. (Network adapter SW01) Check network adapter P.C. board.
*3 Central controller (Send) C05 (Receive) C06	Communication circuit error of central control system (Detected by central controller side)	Continues (By remote controller)	Displayed when error is detected	Check communication wire / miswiring Check communication (U3, U4 terminals) Check network adapter P.C. board. Check central controller (such as central control remote controller, etc.) Check terminal resistance. (TCC-LINK)
Central controller	Indoor Gr sub unit error (Detected by central controller side)	Continuation/Stop (According to each case)	Displayed when error is detected	Check the check code of the corresponding unit from remote controller.

- *2 The check code cannot be displayed by the wired remote controller. (Usual operation of air conditioner becomes unavailable.) For the wireless models, an error is notified with indication lamp.
- *3 This trouble is related to communication of remote controller (A, B), central system (TCC-LINK U3, U4), and
- [E01], [E02], [E03], [E09] or [E18] is displayed or no check display on the remote controller according to the contents.

Error mode detected by outdoor unit

The check code has been ramified from 4 series and after.

The ramified check code is displayed only when both the indoor unit and the outdoor unit are 4 series and after.

(Ex. Combination of RAV-SM1404UT-E with RAV-SP1404AT-E)

When the indoor unit is 3 series and before, the conventional check code is displayed.

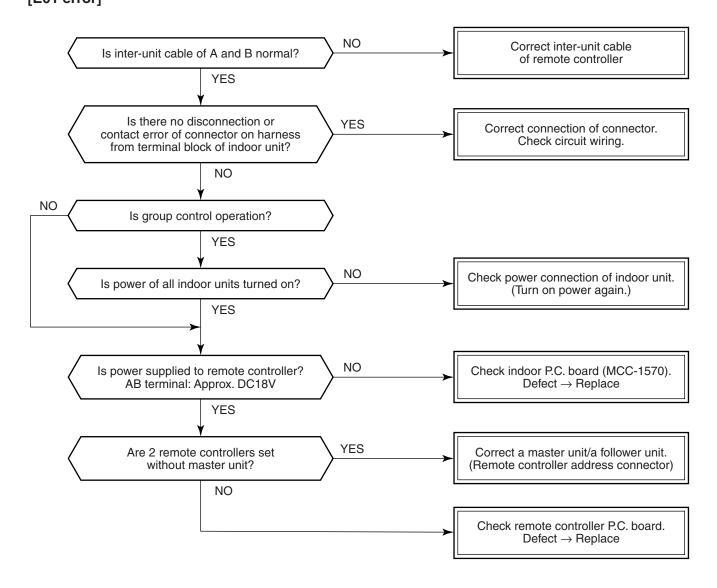
(Ex. Combination of RAV-SM1402BT-E and RAV-SP1404AT-E: Outdoor unit only is 4 series.)

		Operation of diagnostic fund	ction			
	k code or unit	Cause of operation	Status of air condition		Judgment and measures	
before 3 series	after 4 series					
F04	F04	Disconnection, short of discharge temp. sensor (TD)	Stop	Displayed when error is detected	Check discharge temp. sensor (TD). Check outdoor P.C. board.	
F06	F06	Disconnection, short of outdoor temp. sensor (TE)	Stop	Displayed when error is detected	Check temp. sensor (TE). Check outdoor P.C. board.	
	F07	Disconnection, short of outdoor temp. sensor (TL)	Stop	Displayed when error is detected	Check temp. sensor (TL). Check outdoor P.C. board.	
	F12	Disconnection, short of suction temp. sensor (TS)	Stop	Displayed when error is detected	Check suction temp. sensor (TS). Check outdoor P.C. board.	
	F15	Miss-mounting of outdoor temp. sensor (TE, TS)	Stop	Displayed when error is detected	Check temp. sensor (TE, TS). Check outdoor P.C. board.	
F08	F08	Disconnection, short of outside temp. sensor (TO)	Continue	Displayed when error is detected	Check outside temp. sensor (TO). Check outdoor P.C. board.	
L29	F13	Disconnection, short of heat sink temp. sensor (TH)	Stop	Displayed when error is detected	Check outdoor P.C. board.	
	F31	Outdoor P.C. EEPROM error	Stop	Displayed when error is detected	Check outdoor P.C. board.	
	L10	Unset jumper of service P.C. board	Stop	Displayed when error is detected	Outdoor service P.C. board Check model type setting jumper wire.	
	L29	Communication error between outdoor P.C. board MCU	Stop	Displayed when error is detected	Check outdoor P.C. board.	
	P07	Heat sink overheat error * Heat sink temp. sensor detected over specified temperature.	Stop	Displayed when error is detected	Check screw tightening between PC. Board and heat sink and check radiator grease. Check heat sink blast path.	
	P15	Detection of gas leak * Discharge temp. sensor (TD), Suction temp. sensor (TS) detected temperature over specified temp.	Stop	Displayed when error is detected	Check gas leak, recharge Check full open of service valve. Check PMV (Pulse Motor Valve). Check broken pipe. Check discharge temp. sensor (TD), suction temp. sensor (TS).	
	P19	4-way valve inverse error * After heating operation has started, indoor heat exchanger temp. lowers under the specified temp. * After heating operation has started, outdoor heat exchanger / suction temp. rises over the specified temp.	Stop	Displayed when error is detected	Check operation of 4-way valve. Check outdoor heat exchanger (TE), suction temp. sensor (TS). Check indoor heat exchanger sensor (TC). Check 4-way valve coil. Check PMV (Pulse Motor Valve).	
H01	H01	Compressor break down * Although operation has started, operation frequency decreases and operation stops.	Stop	Displayed when error is detected	Check power supply voltage. (AC198 to 264V) Overload operation of refrigerating cycle	
H02	H02	Compressor lock * Over-current detection after compressor start-up	Stop	Displayed when error is detected	Trouble of compressor (Lock, etc.): Replace compressor. Wiring error of compressor (Open phase)	
H03	H03	Current detection circuit error	Stop	Displayed when error is detected	Check outdoor P.C. board. (AC current detection circuit)	

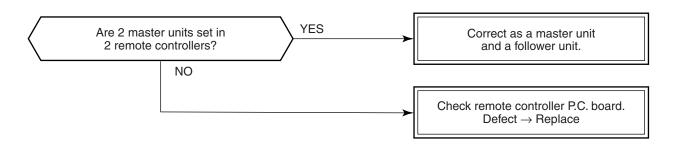
		Operation of diagnostic fund				
Indoor unit		Cause of operation	Status of air conditioner	Condition	Judgment and measures	
before 3 series	after 4 series					
P03	P03	Discharge temp. error * Discharge temp. (TD) over specified value was detected.	Stop	Displayed when error is detected	Check refrigerating cycle (Gas leak) Trouble of electronic expansion valve Check discharge temp. sensor (TD).	
P04	H04	Case thermostat operation * Abnormal overheat of compressor	Stop	Displayed when error is detected	Check case thermostat and connector. Check gas leak, recharge Check full open of service valve. Check PMV (Pulse Motor Valve). Check broken pipe.	
	P05	Power supply voltage error	Stop	Displayed when error is detected	Check power supply voltage. AC198 to 264V	
	P20	High pressure protective operation • During cooling operation, outdoor temp. sensor (TL) detected temperature over specified temp. • During heating operation, indoor temp. sensor (TC, TCJ) detected temperature over specified temp.	Stop	Displayed when error is detected	Check outdoor heat exchanger sensor (TL). Check indoor heat exchanger sensor (TC, TCJ). Check full open of service valve. Check indoor/outdoor fan. Check PMV (Pulse Motor Valve). Check clogging and short circuit of indoor/outdoor heat exchanger. Overcharge of refrigerant. Recharge	
P22	P22	Outdoor fan system error	Stop	Displayed when error is detected	Check lock of fan motor. Check power supply voltage. AC198 to 264V Check outdoor P.C. board.	
P26	P26	Short-circuit error of compressor driving element	Stop	Displayed when error is detected	When performing operation while taking-off compressor wire, P26 error occurs. Check control P.C. board. When performing operation while taking-off compressor wire, an error does not occur. (Compressor rare short)	
P29	P29	Position detection circuit error	Stop	Displayed when error is detected	1. Check control P.C. board.	

9-2-4. Diagnostic Procedure for Each Check Code (Indoor Unit)

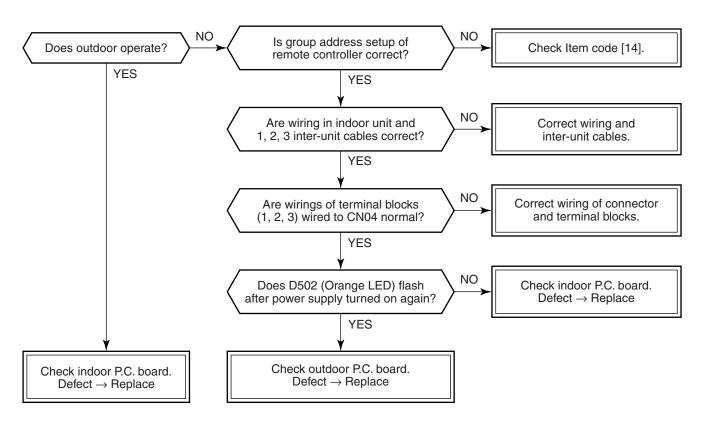
Check code [E01 error]



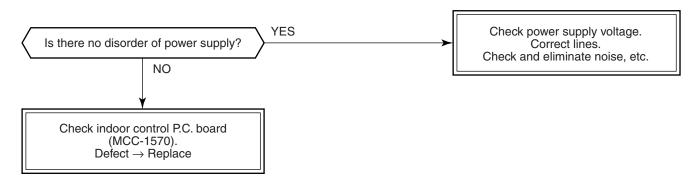
[E09 error]



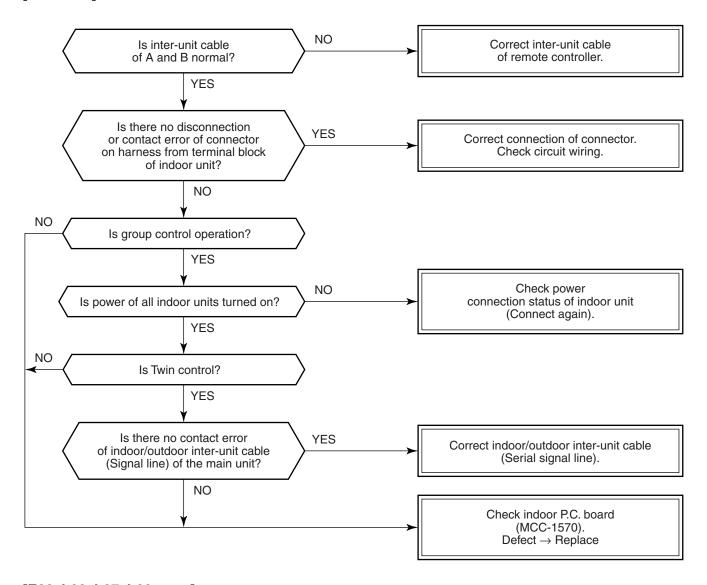
[E04 error]



[E10 error]



[E18 error]



[E08, L03, L07, L08 error]

E08: Duplicated indoor unit No.

L03: There are 2 or more master units in a group control.

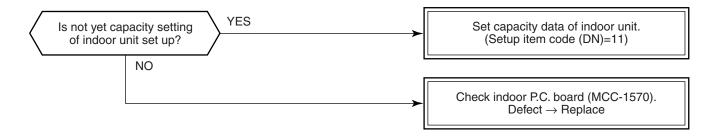
L07: There is 1 or more group address [Individual] in a group control.

L08: The indoor group address is unset. (12. ADDRESS SETUP)

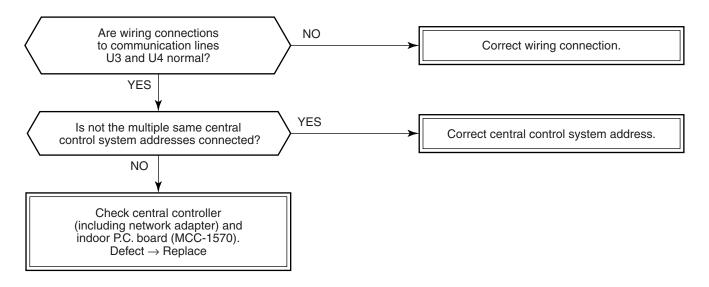
If the above error is detected when power supply turned on, the mode enters automatically in the automatic address set mode. (Check code is not output.)

However, if the above error is detected during the automatic address set mode, a check code may be output.

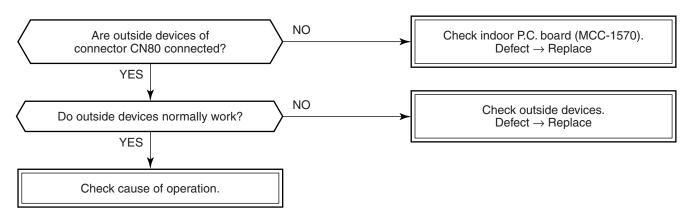
[L09 error]



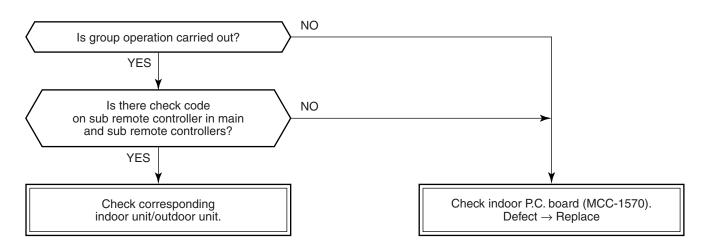
[L20 error]



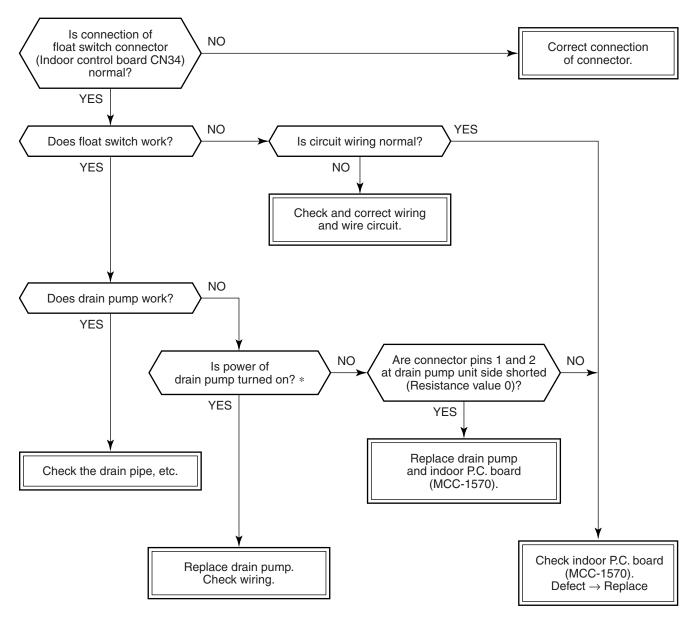
[L30 error]



[P30 error] (Central controller)

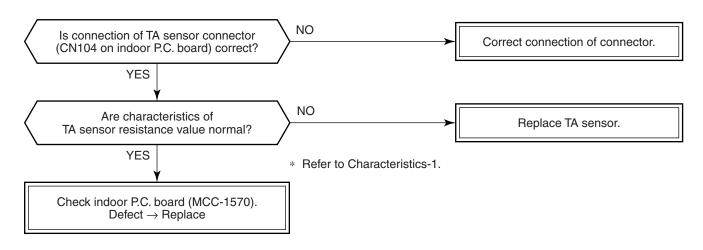


[P10 error]

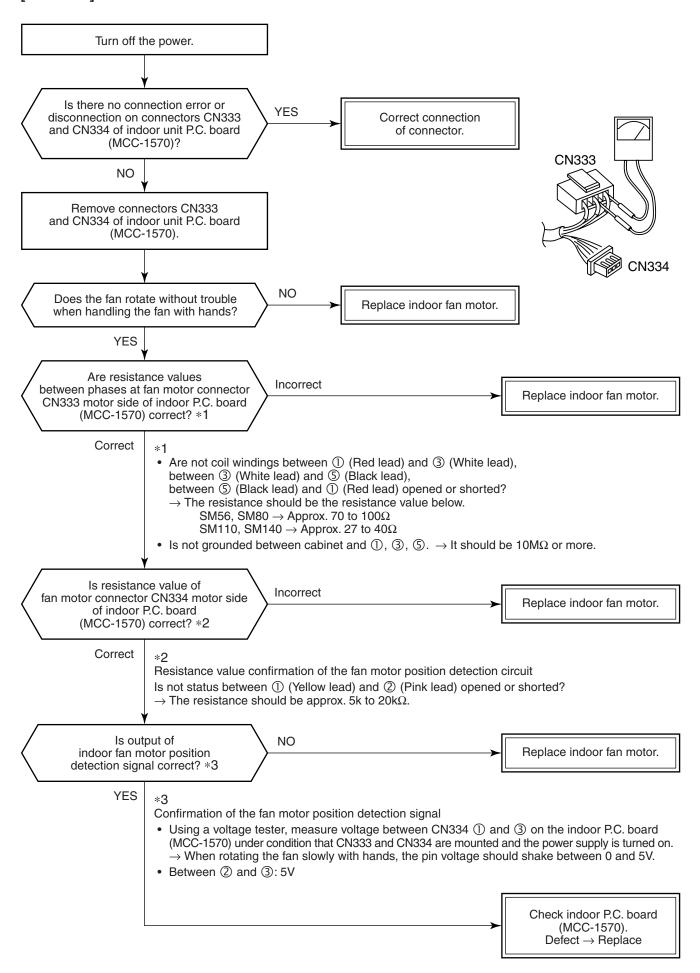


* Check that voltage of 1-2 pin of CN504 on the indoor P.C. board is +12V. (1 pin is plus (+).)

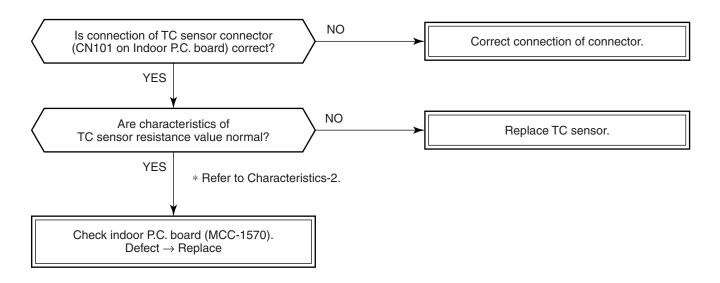
[F10 error]



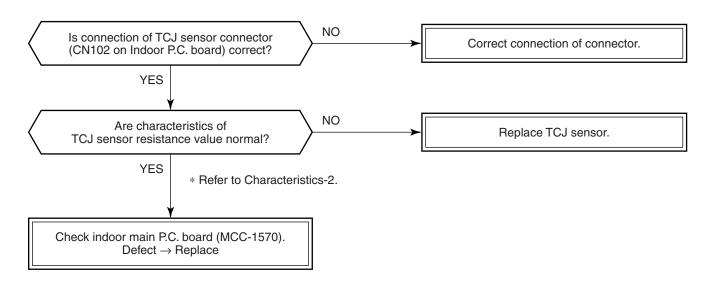
[P12 error]



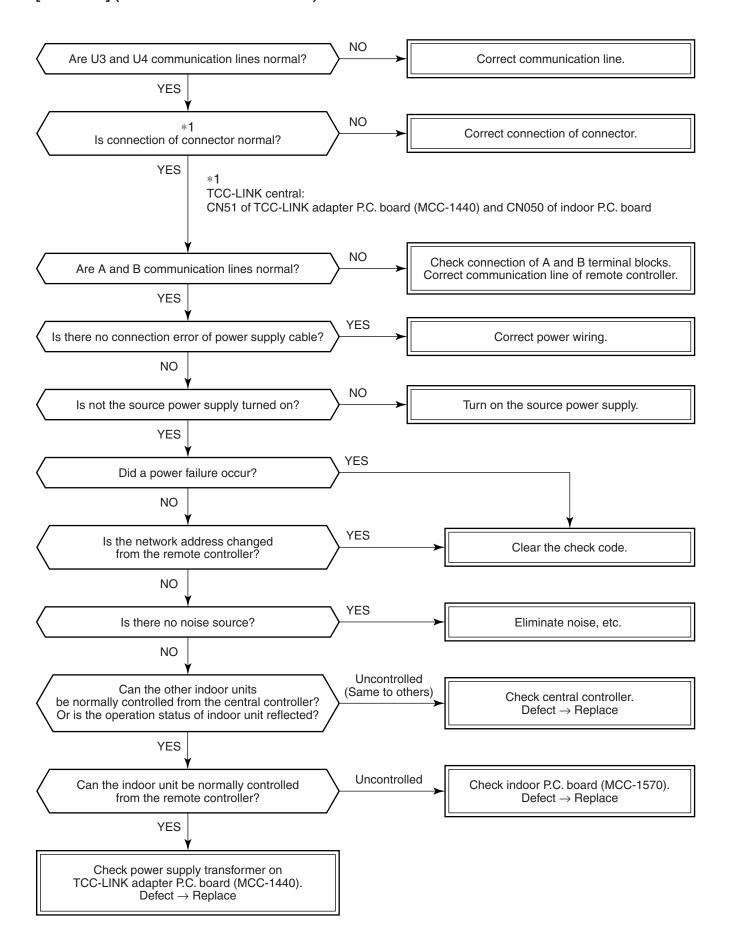
[F02 error]



[F01 error]



[C06 error] (TCC-LINK central controller)



[E03 error] (Master indoor unit)

[E03 error] is detected when the indoor unit cannot receive a signal from the remote controller (also central controller).

Check A and B remote controllers and communication lines of the central control system U3 and U4.

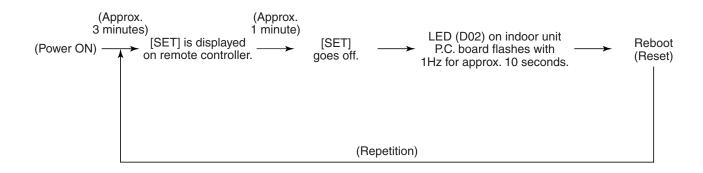
As communication is impossible, this check code [E03] is not displayed on the remote controller and the central controller. [E01] is displayed on the remote controller and [C06 error] is displayed on the central controller.

If these check codes generate during operation, the air conditioner stops.

[F29 error]

This check code indicates a detection error of IC10 non-volatile memory (EEPROM) on the indoor unit P.C. board, which generated during operation of the air conditioner. Replace the service P.C. board.

* When EEPROM was not inserted when power supply turned on or when the EEPROM data read/write operation is impossible at all, the automatic address mode is repeated. In this time, [97 error] is displayed on the central controller.



[P31 error] (Follower indoor unit)

When the master unit of a group operation detected [E03], [L03], [L07] or [L08] error, the follower unit of the group operation detects [P31 error] and then the unit stops.

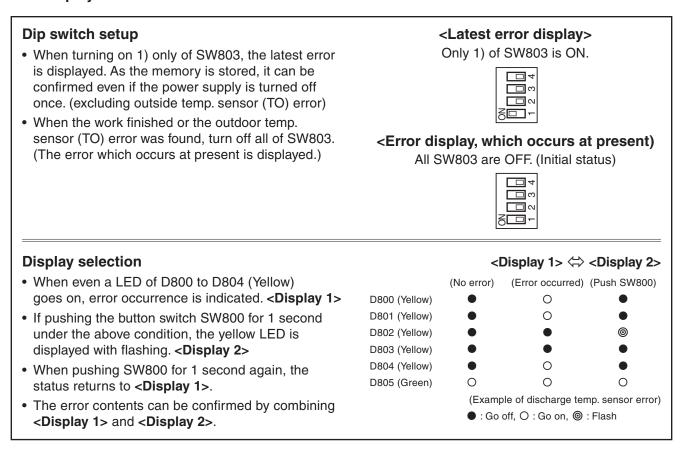
There is no display of the check code or alarm history of the remote controller. (In this model, the mode enters in automatic address set mode when the master unit detected [L03], [L07] or [L08] error.)

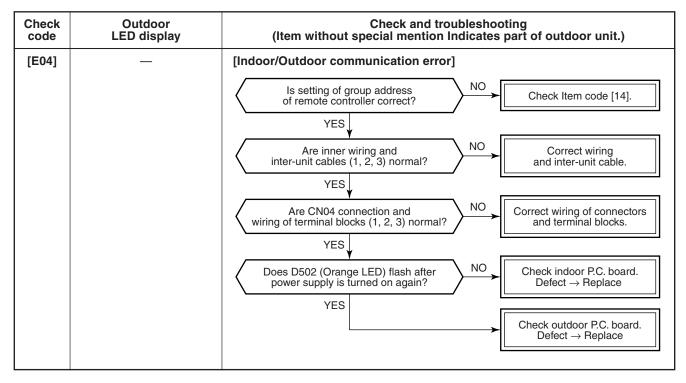
9-2-5. Diagnostic Procedure for Each Check Code (Outdoor Unit)

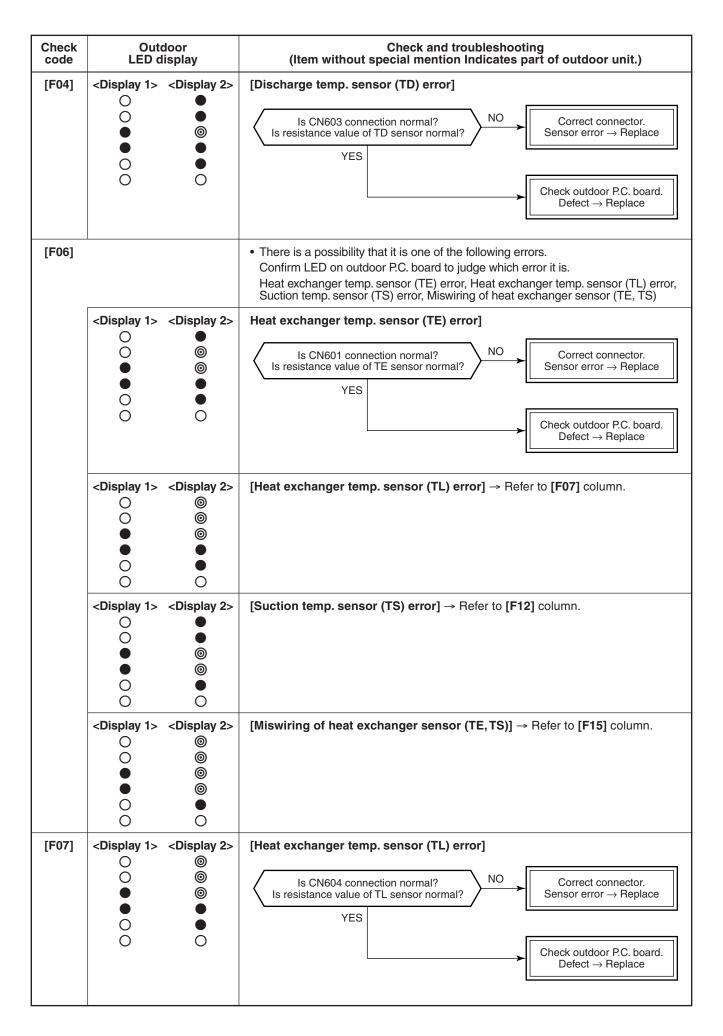
- 1) This section describes the diagnostic method for each check code displayed on the remote controller.
- 2) In some cases, a check code indicates multiple symptoms.

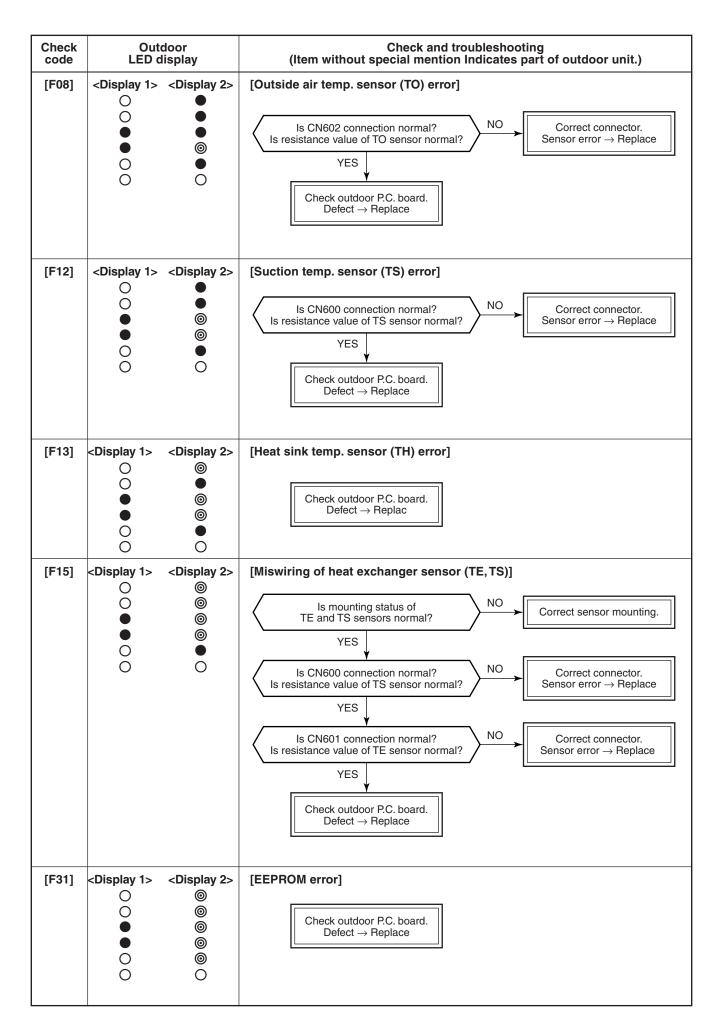
 In this case, confirm LED display on the outdoor P.C. board to narrow the contents to be confirmed.
- 3) The check code on the remote controller is displayed only when the same error occurred continuously by multiple times while LED of the outdoor P.C. board displays even an error which occurred once. Therefore the display on the remote controller may differ from that of LED.

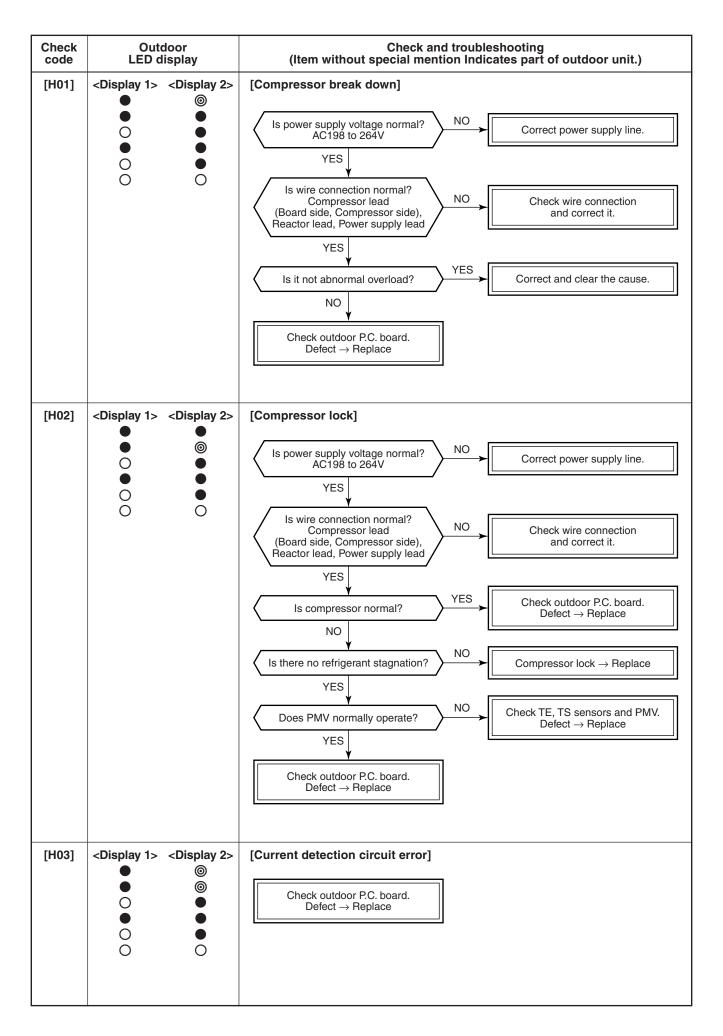
LED display on outdoor P.C. board

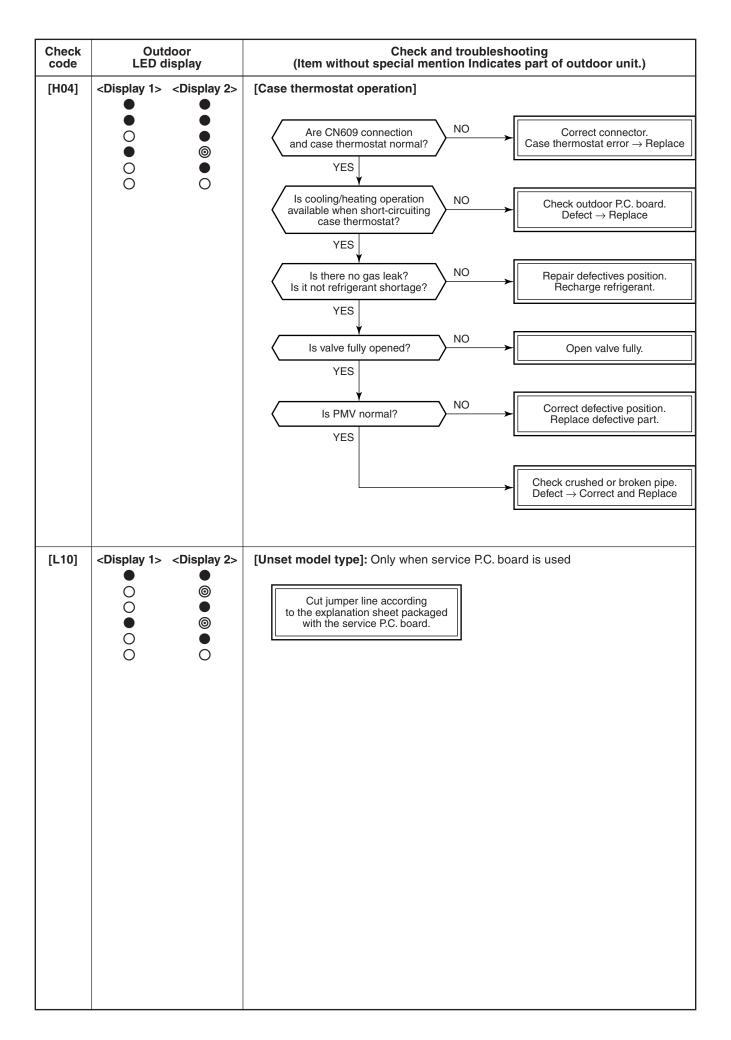




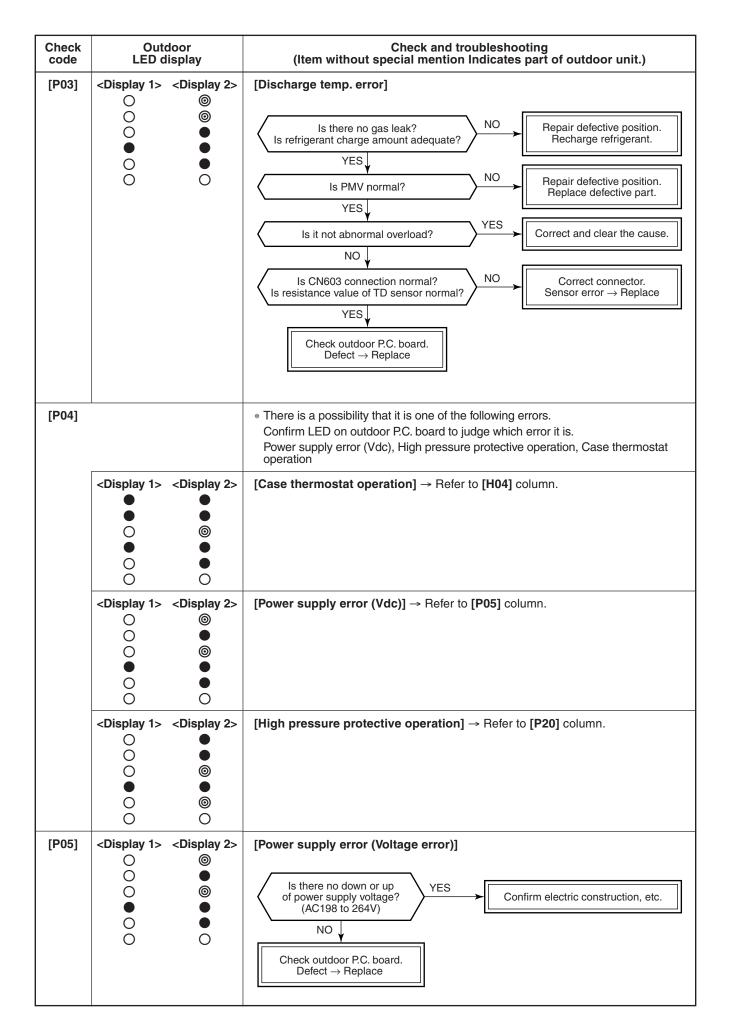


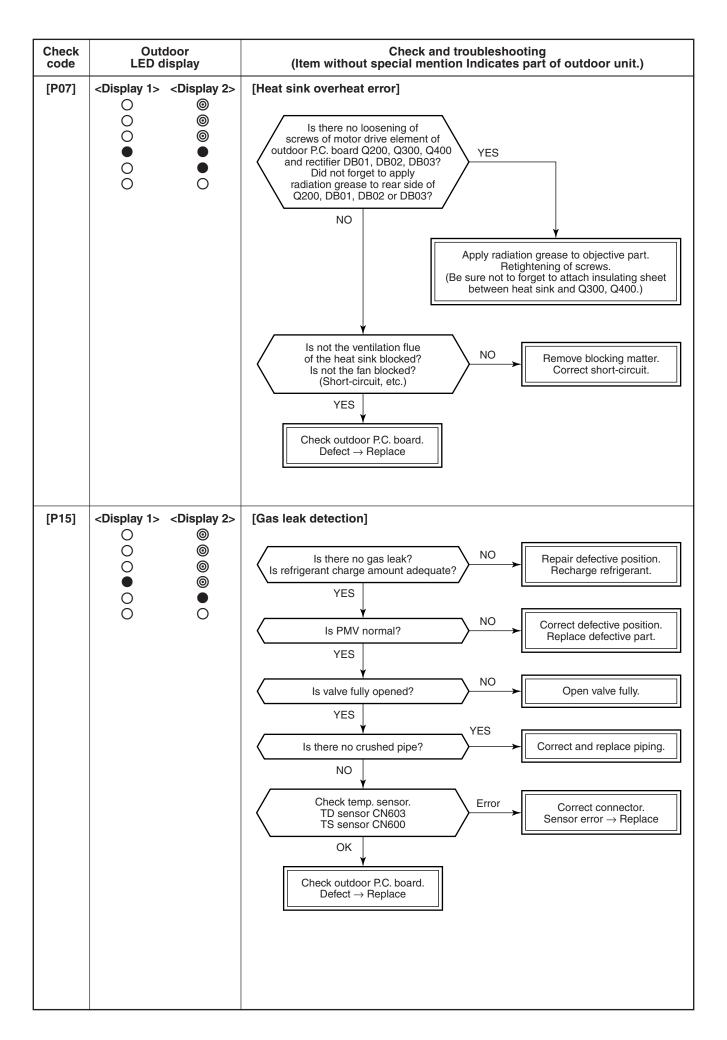


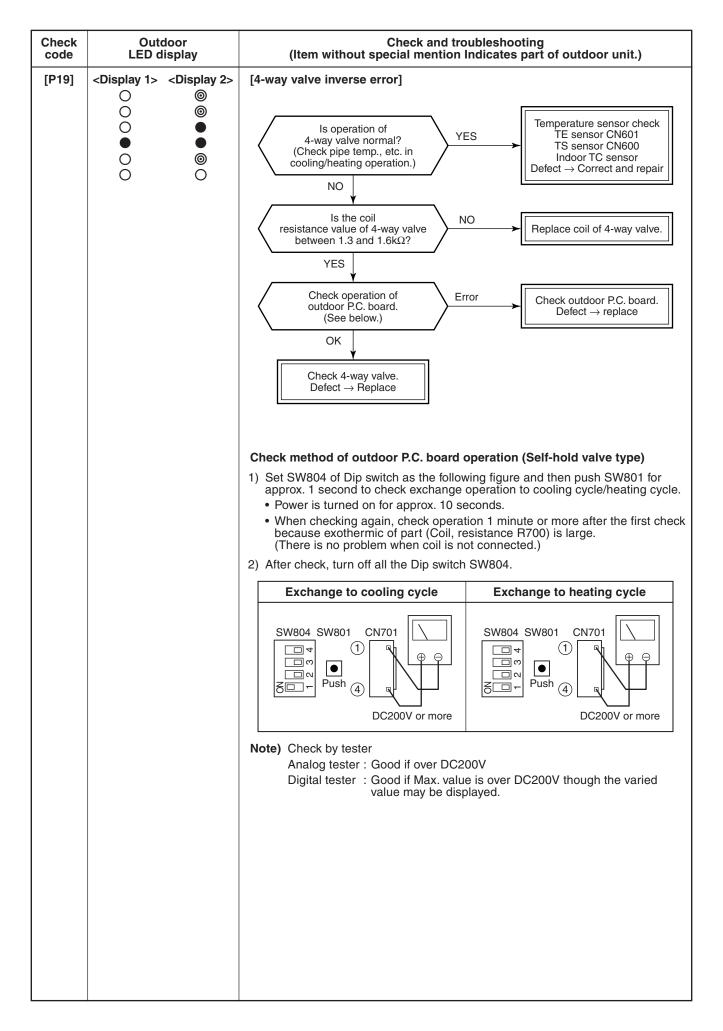


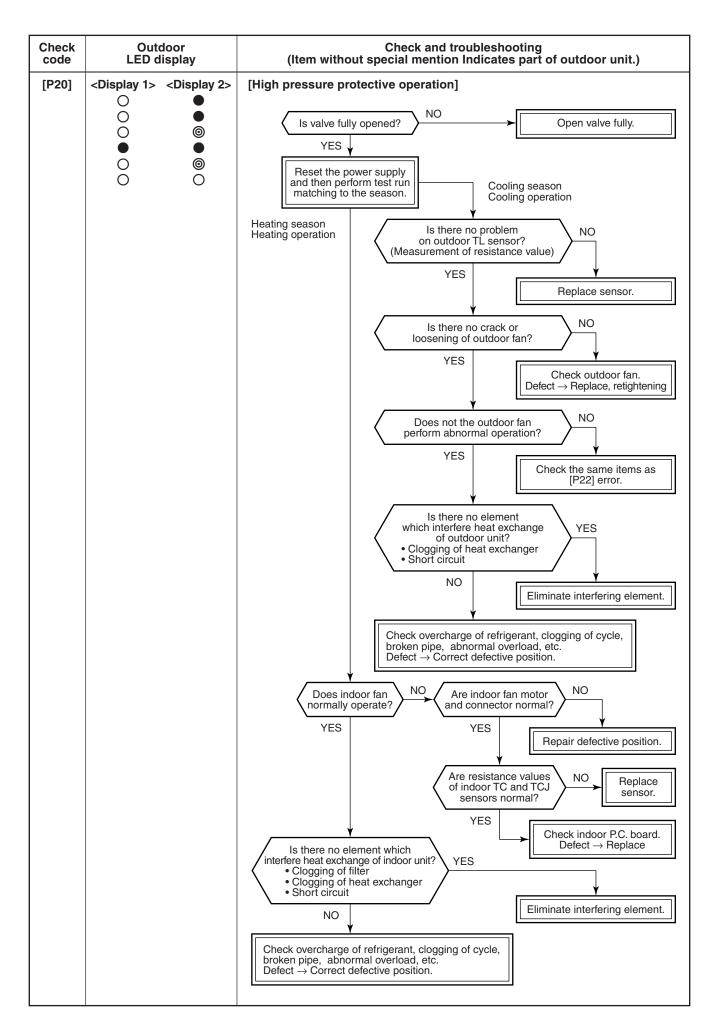


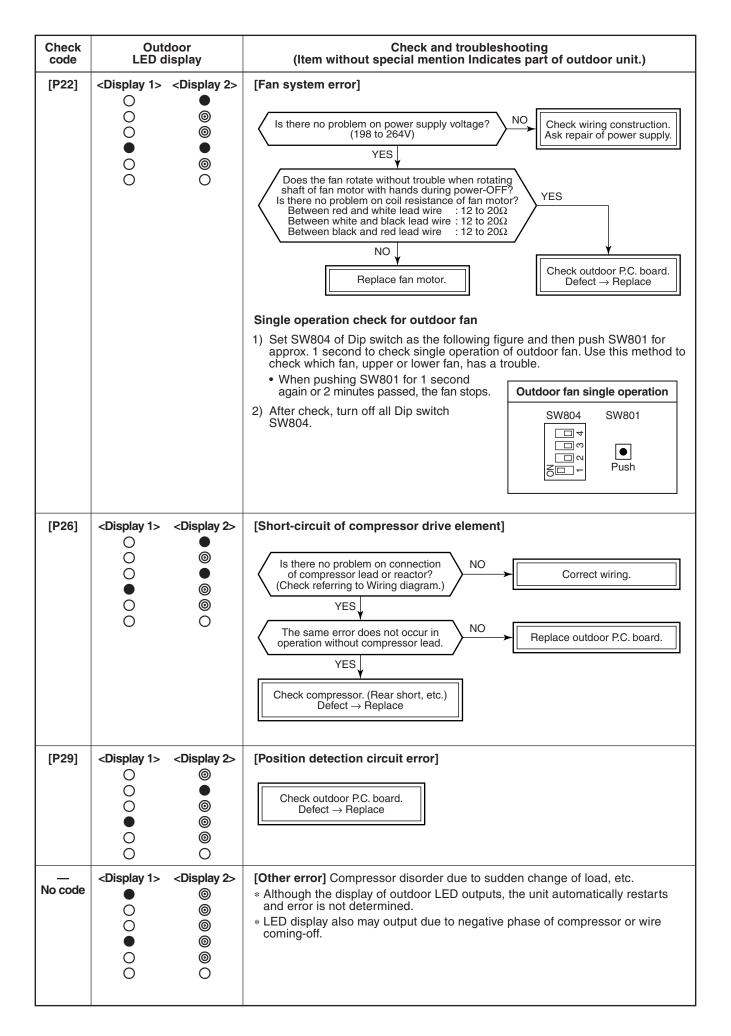
Check code		door lisplay	Check and troubleshooting (Item without special mention Indicates part of outdoor unit.)
[L29]			* There is a possibility that it is one of the following errors. Confirm LED on outdoor P.C. board to judge which error it is. Communication error between MCU, Heat sing temp. sensor (TH) error, EEPROM error, Unset model type, Heat sink overheat error, Gas leak detection, 4-way valve inverse error
	<display 1=""></display>	<display 2=""></display>	[Communication error between MCU] Check outdoor P.C. board. Defect → Replace
	<display 1=""></display>	<display 2=""></display>	[Heat sink temp. sensor (TH) error] → Refer to [F13] column.
	<display 1=""></display>	<display 2=""></display>	[EEPROM error] → Refer to [F31] column.
	<display 1=""></display>	<display 2=""></display>	[Unset model type] → Refer to [L10] column.
	<display 1=""></display>	<display 2=""></display>	[Heat sink overheat error] → Refer to [P07] column.
	<display 1=""></display>	<display 2=""></display>	[Gas leak detection] → Refer to [P15] column.
	<display 1=""></display>	<display 2=""></display>	[4-way valve inverse error] → Refer to [P19] column.











TA, TC, TCJ, TE, TS, TO sensors

TD, TL sensors

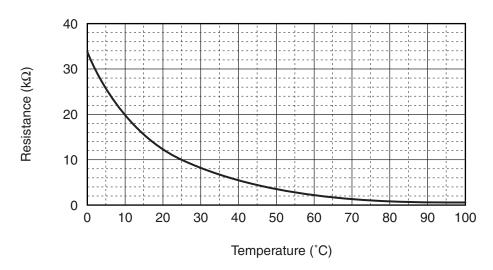
Representative value

Temperature	Resistance value (kW)				
(°C)	(Minimum value)	(Standard value)	(Maximum value)		
0	32.33	33.80	35.30		
10	19.63	20.35	21.09		
20	12.23	12.59	12.95		
25	9.75	10.00	10.25		
30	7.764	7.990	8.218		
40	5.013	5.192	5.375		
50	3.312	3.451	3.594		
60	2.236	2.343	2.454		
70	1.540	1.623	1.709		
80	1.082	1.146	1.213		
90	0.7740	0.8237	0.8761		
100	0.5634	0.6023	0.6434		

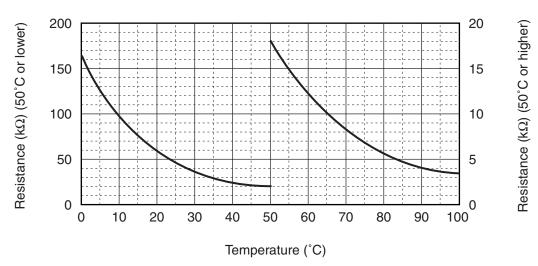
Representative value

Temperature	Resistance value (kW)				
(°C)	(Minimum value)	(Standard value)	(Maximum value)		
0	150.5	161.3	172.7		
10	92.76	99.05	105.6		
20	58.61	62.36	66.26		
25	47.01	49.93	52.97		
30	37.93	40.22	42.59		
40	25.12	26.55	28.03		
50	17.00	17.92	18.86		
60	11.74	12.34	12.95		
70	8.269	8.668	9.074		
80	5.925	6.195	6.470		
90	4.321	4.507	4.696		
100	3.205	3.336	3.468		

TA, TC, TCJ, TE, TS, TO sensors



TD, TL sensors



^{*} As TH sensor (Outdoor unit heat sink temp. sensor) is incorporated in the outdoor control P.C. board, the resistance value cannot be measured.

10. REPLACEMENT OF SERVICE P.C. BOARD

10-1. Indoort Unit

<Note: when replacing the P.C. board for indoor unit servicing>

The nonvolatile memory (hereafter called EEPROM, IC503) on the indoor unit P.C. board before replacement includes the model specific type information and capacity codes as the factory-set value and the important setting data which have been automatically or manually set when the indoor unit is installed, such as system/indoor/group addresses, high ceiling select setting, etc.

When replacing the P.C. board for indoor unit servicing, follow the procedures below.

After replacement completes, confirm whether the settings are correct by checking the indoor unit No., Group header unit/follower unit settings and perform the cooling cycle confirmation through the trial operation.

<Replacement procedures>

CASE 1

Before replacement, the indoor unit can be turned on and the setting data can be read out by wired remote control operation.

EEPROM data read out [1]

尣

Replacement of P.C. board for Indoor unit servicing and power on [2]

 $\hat{1}$

Writing the read out EEPROM data [3]

①

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

CASE 2

The EEPROM before replacement is defective and the setting data cannot be read out.

EEPROM data read out [2]

Ú

Writing the setting data to EEPROM, such as high ceiling installation setting and optional connection setting, etc., based on the customer information. [3]

Ί٢

Power reset

(for all indoor units connected to the remote control when the group operation control is performed.)

[1] Setting data read out from EEPROM

The setting data modified on the site, other than factory-set value, stored in the EEPROM shall be read out.

- Step 1 Push $\stackrel{\text{SET}}{\frown}$, $\stackrel{\text{CL}}{\frown}$ and $\stackrel{\text{TEST}}{\frown}$ button on the remote controller simultaneously for more than 4 seconds.
 - * When the group operation control is performed, the unit No. displayed for the first time is the header unit No. At this time, the CODE No. (DN) shows " / ①". Also, the fan of the indoor unit selected starts its operation and the swing operation also starts if it has the louvers.
- Step 2 Every time when the button is pushed, the indoor unit No. under the group control is displayed in order. Specify the indoor unit No. to be replaced.
 - 1. Change the CODE No. (DN) to ⟨Û-Û/ by pushing ▼ / ▲ buttons for the temperature setting. (this is the setting for the filter sign lighting time.)

At this time, be sure to write down the setting data displayed.

- Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting.
 Similarly, be sure to write down the setting data displayed.
- 3. Repeat the step 2-2 to set the other settings in the same way and write down the setting data as shown in the table 1 (example).
 - * The COCE No. (DN) are ranged from " \mathcal{G}' " to " \mathcal{FF} ". The CODE No. (DN) may skip.
- Step 3 After writing down all setting data, push $\stackrel{\text{TEST}}{\nearrow}$ button to return to the normal stop status. (It takes approx. 1 min until the remote controller operation is available again.)

CODE No. required at least

DN	Contents	
10	Туре	
11	Indoor unit capacity	
12	System address	
13	Indoor unit address	
14	Group address	

- 1. The CODE No. for the Indoor unit type and Indoor unit capacity are required to set the rotation number setting of the fan.
- If the system/indoor/group addresses are different from those before replacement, the auto-address setting mode starts and the manual resetting may be required again. (when the multiple units group operation including twin system.)

[2] P.C. Board for indoor unit servicing replacement procedures

Step 1 Replace the P.C. board to the P.C. board for indoor unit servicing.

At this time, perform the same setting of the jumper wire (J01) setting (cut), switch SW501, (short-circuit) connector CN34 as the setting of the P.C. board before replacement.

- Step 2 According to the system configuration, turn on the indoor unit following to the either methods shown below.
 - a) Single operation (Indoor unit is used as standalone.)

Turn on the indoor unit.

- 1. After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3]. (System address = 1, Indoor unit address = 1, Group address = 0 (standalone) are automatically set.)
- b) Group operation (including twin system)

Turn on the indoor unit(s) with its P.C. board replaced to the P.C. board for indoor unit servicing, according to either methods 1 or 2 shown below.

- 1. Turn on only the indoor unit with its P.C. board replaced. (Be sure to confirm the remote controller is surely connected. If not, the operation [3] cannot be performed.)
 - Perform either methods 1 or 2 described in item a) above.
- 2. Turn on the multiple indoor units including the indoor unit with its P.C. board replaced.
 - · Twin 1 system only
 - · All group connections

After completion of the auto-address setting mode (required time: approx. 5 min.), proceed to [3].

* The header unit of the group may be changed by performing the auto-address setting.

Also, the system address/Indoor unit address of the indoor unit with its P.C. board replaced may be assigned to the addresses (not used) other than those of the indoor units without its P.C. board replaced. It is recommended to keep the information in advance, which cooling system the indoor unit belongs to or whether the indoor unit works as the header unit or the follower unit in the group control operation.

[3] Writing the setting data to EEPROM

The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.

- **Step 1** Push $\stackrel{\text{SET}}{\frown}$, $\stackrel{\text{CL}}{\frown}$ and $\stackrel{\text{TEST}}{\frown}$ buttons on the remote controller simultaneously for more than 4 seconds.
 - * In the group control operation, the unit No. displayed for the first time is the header unit No. At this time, the CODE No. (DN) shows "/". Also, the fan of the indoor unit selected starts its operation and the swing operation starts if it has the louvers.

(The unit No. " ALL" is displayed if the auto-address setting mode is interrupted in [2] step 2 a))

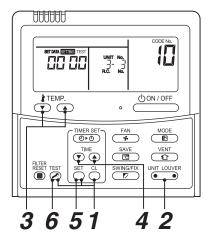
Step 2 Every time when button is pushed, the indoor unit Nos. in the group control operation are displayed in order.

(The settings stored in the EEPROM of the P.C. board for indoor unit servicing are the factory-set values.) Specify the indoor unit No. with its P.C. board replaced to the P.C. board for indoor unit servicing. (You cannot perform this operation if " *FLL*" is displayed.)

- Step 3 Select the CODE No. (DN) can be selected by pushing the ▼ / ▲ button for the temperature setting.
 - Set the indoor unit type and capacity.
 The factory-set values shall be written to the EEPROM by changing the type and capacity.
 - 1. Set the CODE No. (DN) to " $/\mathcal{D}$ ". (without change)
 - Select the type by pushing ▼ / ▲ buttons for the timer setting. (For example, 4-way Air Discharge Cassette Type is set to "0001". Refer to table 2)

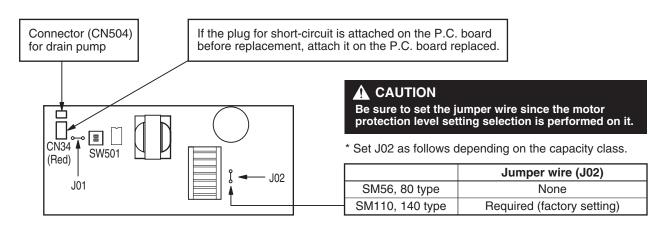
 - Change the CODE No. (DN) to " / / " by pushing ▼ / ▲ buttons for the temperature setting.
 - Select the capacity by pushing ▼ / ▲ buttons for the timer setting. (For example, 80 Type is set to "0012". Refer to table 2)

<Fig. 1 RBC-AMT32E>



Setting 4-way air discharge cassette Indoor Unit model only

- 7. Using the set temperature ▼ / ▲ buttons, set "[F" to the CODE No. (DN).
- 8. Using the timer time 🕡 / 🛦 buttons, set the data. (0001)
- 9. Push button. (The setting completes if the setting data are displayed.)



- Push the button to return to the normal stop status.
 (It takes approx. 1 min until the remote controller operation is available again.)
- **Step 4** Write the on-site setting data to the EEPROM, such as address setting, etc. Perform the steps 1 and 2 above again.
- Step 5 Change the CODE No. (DN) to "∂/" by pushing ▼ / ▲ buttons for the temperature setting. (this is the setting for the filter sign lighting time.)

- Step 6 Check the setting data displayed at this time with the setting data put down in [1].
 - 1. If the setting data is different, modify the setting data by pushing 🕡 / 🛦 buttons for the timer setting to the data put down in [1].
 - The operation completes if the setting data is displayed.
 - 2. If the data is the same, proceed to next step.
- Step 7 Change the CODE No. (DN) by pushing ▼ / ▲ buttons for the temperature setting.

 As described above, check the setting data and modify to the data put down in [1].
- Step 8 Repeat the steps 6 and 7.
- Step 9 After the setting completes, push $\overset{\text{TEST}}{\nearrow}$ button to return to the normal stop status. (It takes approx. 1 min until the remote control operation is available again.)
 - * The COCE No. (DN) are ranged from " $\mathcal{D}I$ " to " \mathcal{FF} ". The CODE No. (DN) is not limited to be serial No. Even after modifying the data wrongly and pushing $\stackrel{\text{SET}}{\bigcirc}$ button, it is possible to return to the data before modification by pushing $\stackrel{\text{CL}}{\bigcirc}$ button if the CODE No. (DN) is not changed.

<Fig. 2 EEPROM layout diagram>

The EEPROM (IC503) is attached to the IC socket. When detaching the EEPROM, use a tweezers, etc. Be sure to attach the EEPROM by fitting its direction as shown in the figure.

* Do not bend the IC lead when replacing.

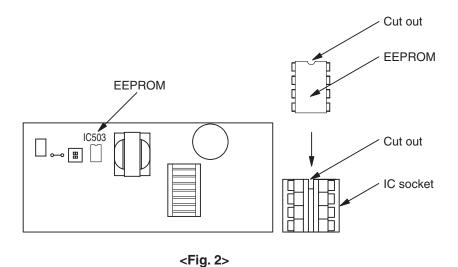


Table 1. Setting data (CODE No. table (example))

DN	Item	Setting data	Factory-set value
01	Filter sign lighting time		Depending on Type
02	Filter pollution leve		I 0000: standard
03	Central control address		0099: Not determined
06	Heating suction temperature shift		0002: +2°C (flooring installation type: 0)
OF	Cooling only		0000: Heat pump
10	Туре		Depending on model type
11	Indoor unit capacity		Depending on capacity type
12	System address		0099: Not determined
13	Indoor unit address		0099: Not determined
14	Group address		0099: Not determined
19	Flap type (wind direction adjustment)		Depending on Type.
1E	Temperature range of cooling/heating automatic SW control point		0003: 3 deg (Ts ± 1.5)
28	Power failure automatic recovery		0000: None
2A	Option/Abnormal input (CN70) SW		0002: Humidifier
2b	Thermo output SW (T10 ③)		0000: Thermo ON
31	Ventilation fan (standalone)		0000: Not available
32	Sensor SW		0000: Body sensor
40	Humidifier control (+ drain pump control)		0003: Humidifier ON + Pump OFF
5d	High ceiling SW		0000: Standard
60	Timer setting (wired remote controller)		0000: Available
C2	Demand setting (outdoor unit current demand)		0075: 75 %
d0	Remote controller operation save function		0001: Enable
d3	Rotation number of the self-clean operation		0001: 210ypm(at self-clean operation)
d1	Frost protection function		0000: None
F0	Swing mode		0001: Standard
F1	Louver fixing position (Flap No. 1)		0000: Not fixed
F2	Louver fixing position (Flap No. 2)		0000: Not fixed
F3	Louver fixing position (Flap No. 3)		0000: Not fixed
F4	Louver fixing position (Flap No. 4)		0000: Not fixed

Table 2. Type: CODE No. 10

Setting data	Туре	Type name abb.
0001*1*2	4-way Air Discharge Cassette Type	RAV-SM***UT-E

^{*1} EEPROM initial value on the P.C. board for indoor unit servicing



<Model Name: RAV-SM***UT-E>

For the above models, set the CODE No. to " $\mathcal{L}\mathcal{E}$ " and the setting data 0000 (initial) to "0001".

Table 3. Indoor unit capacity: CODE No. 11

Setting data	Туре
0000*	Disable
0009	56
0012	80
0015	110
0017	140

* EEPROM initial value on the P.C. board for indoor unit servicing.

10-2. Outdoor Unit

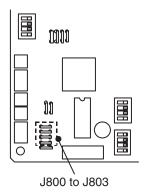
1. Setting the jumper wires and DIP switches

Part name		Function	Setting	
Jumper wire	J800 to J803	Model switching	Cut these jumper wires according to the following table.	
	J804 to J810	Settings	Set these jumper wires to the settings of the P.C. board before replacement.	
DIP switch	SW802	Settings	Set SW802 to the setting of the P.C. board before replacement.	
	SW803	LED indication switching	Set SW803 to all OFF.	
	SW804	Special operations for service	Set SW804 to all OFF.	

Model switching (J800 to J803)

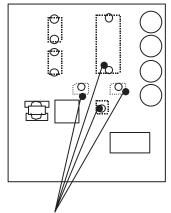
Since this service P.C. board is available for several models, cut the jumper wires according to the following table. If they are not cut correctly, an error code "L10" or "L29" appears on the remote controller and the operation of the air conditioner is disabled.

Model name	J 800	J 801	J 802	J 803
Factory setting (default)	0	0	0	0
RAV-SP1104AT*-E	X	0	0	0
RAV-SP1404AT*-E	0	X	0	0
Characters that indicate the following: No character Standard models Z For salt-affected areas ZG For heavily salt-affected areas	◯ : Connected, 🗶 : Cut			

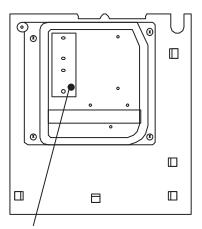


2. Installing the P.C. board

- 1) Apply thermal grease to the back (heat sink contacting side) of devices Q200, Q650, DB01, and DB02. (Q300 and Q400 are not necessary to be applied thermal grease.)
- 2) Reuse the insulating sheet. When a small amount of thermal grease is applied to the back of the insulating sheet, it adheres temporarily to the heat sink, which makes it easy to attach the insulating sheet.
- 3) Insert the P.C. board, align the holes of the insulating sheets, semiconductor devices, and heat sinks, and then secure them with screws.
- 4) Connect the lead wires according to the wiring diagram sticked on the backside of the pannel .



Apply thermal grease to the back (heat sink contacting side) of Q200, Q650, DB01, and DB02.



Reuse the insulating sheet. Applying thermal grease to the back of the insulating sheet makes it easy to attach the insulating sheet.

11. SETUP AT LOCAL SITE AND OTHERS

11-1. Indoor Unit

11-1-1. Test Run Setup on Remote Controller

<Wired remote controller>

- 1. When pushing button on the remote controller for 4 seconds or more, "TEST" is displayed on LC display. Then push button.
 - "TEST" is displayed on LC display during operation of Test Run.
 - During Test Run, temperature cannot be adjusted but air volume can be selected.
 - In heating and cooling operation, a command to fix the Test Run frequency is output.
 - Detection of error is performed as usual. However, do not use this function except case of Test Run because it applies load on the unit.
- 2. Use either heating or cooling operation mode for [TEST].

NOTE: The outdoor unit does not operate after power has been turned on or for approx. 3 minutes after operation has stopped.

3. After a Test Run has finished, push button again and check that [TEST] on LC display has gone off. (To prevent a continuous test run operation, 60-minutes timer release function is provided to this remote controller.)

<Wireless remote controller>

(4-way Air Discharge Cassette Type only)

1 Turn off power of the unit.

Remove the adjuster attached with sensors from the ceiling panel. For removing, refer to the Installation manual attached to the ceiling panel.

(Be careful to handle the adjuster because cables are connected to the sensor.)

Remove the sensor cover from the adjuster. (1 screw)

2 Change ON of Bit [1:TEST] of the sensor P.C. board switch [S003] to OFF.

Mount the sensor cover and mount the adjuster with sensor to the ceiling panel.

Turn on power of the unit.

3 Push button on the wireless remote controller and select [COOL] or [HEAT] operation mode using button.

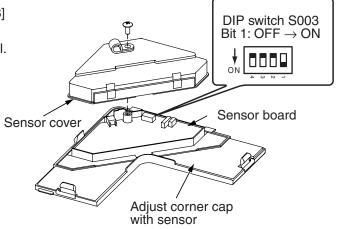
(All the display lamps of sensors on the wireless remote controller flash during Test Run.)

- Do not perform Test Run operation in other modes than [HEAT] / [COOL] mode.
- Detection of error is performed as usual.
- **4** After Test Run operation, push button to stop the operation.

5 Turn off power of the unit.

Return Bit [1] of the sensor P.C. board switch [S003] to the original position. (ON \rightarrow OFF)

Mount the adjuster with sensors to the ceiling panel.



(Except 4-way Air Discharge Cassette Type and Under Ceiling Type)

1 Remove a screw which fixes the serial olate of the receiver part on the wireless remote controller.

Remove the nameplate of the reciver section by inserting a minus screwdriver, etc. into the notch at the bottom of the plate, and set the Dip switch to [TEST RUN ON].

- $m{2}$ Execute a test operation with \oplus button on the wireless remote controller.
 - (1), (2) and (3) LED flash during test operation.
 - Under status of [TEST RUN ON], the temperature adjustment from the wireless remote controller is invalid.

Do not use this method in the operation other than test operation because the equipment is damaged.

- 3 Use either [COOL] or [HEAT] operation mode for test operation.
 - The outdoor unit does not operate approx. 3 minutes after power-ON and operation stop.
- After the test operation finished, stop the air conditioner from the wireless remote controller, and return Dip switch of the sensor section as before.

 (A 60 minutes timer clearing function is attached to the sensor section in order to prevent a continuous test operation.)

(Under Ceiling Type only)

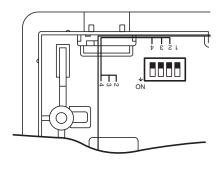
1 Turn off power of the air conditioner.

Remove the adjust corner cap attached with sensor section from the ceiling panel. For removing method, follow to the installation manual attached to the ceiling panel. (Be careful to handle the sensor section because cables are connected to the sensor section.)

Remove the sensor cover from the adjust corner cap. (1 screw)

- **2** Change Bit [1:TEST] of the switch [S003] on the sensor P.C. board from OFF to ON. Mount the sensor cover and attach the adjust corner cap with with sensors to the ceiling panel. Turn on power of the air conditioner.
- **3** Push (1) button of the wireless remote controller and select an operation mode [COOL] or [HEAT] with (1) button. (All the display lamps of the wireless remote controller sensor section flash during the tst operation.)
 - Do not use operation mode other than [COOL] or [HEAT].
 - Error is detected as usual.
- 4 When the test operation has finished, push button to stop the operation.
- **5** Turn off power of the air conditioner.

Change Bit [1] of the switch [S003] on the sensor P.C. board from ON to OFF. Attach the adjust corner cap with sensors to the ceiling panel.



<In case of wireless remote controller>

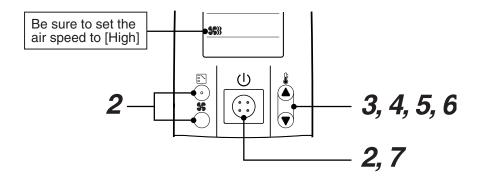
Procedure	Description				
	Turn on power of the air conditioner.				
1	The operation is not accepted for 5 minutes when power has been turned on at first time after installation, and 1 minute when power has been turned on at the next time and after. After the specified time has passed, perform a test operation.				
2	Push [Start/Stop] button and change the operation mode to [COOL] or [HEAT] with [Mode] button. Then change the fan speed to [High] using [Fan] button.				
	Test cooling operation	Test heating operation			
3	Set temperature to [18°C] using [Temperature set] button.	Set temperature to [30°C] using [Temperature set] button.			
4	After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [19°C]	After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [29°C].			
5	After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [18°C].	After checking the receiving sound "Pi", immediately push [Temperature set] button to set to [30°C].			
6	Then repeat the procedure $4 \rightarrow 5 \rightarrow 4 \rightarrow 5$. After approx. 10 seconds, all the display lamps on the sensor part of wireless remote controller, [Operation] (Green), [Timer] (Green), and [Ready] (Yellow) flash and the air conditioner starts operation. If the lamps do not flash, repeat the procedure 2 and after.				
7	After the test operation, push [Start/Stop] button to stop the operation.				

<Outline of test operation from the wireless remote controller>

Test cooling operation:

$$Start \to 18^{\circ}C \to 19^{\circ}C \to 18^{\circ}C \to 19^{\circ}C \to 18^{\circ}C \to 19^{\circ}C \to 18^{\circ}C \to (Test \ operation) \to Stop \ Test \ heating \ operation:$$

$$Start \rightarrow 30^{\circ}C \rightarrow 29^{\circ}C \rightarrow 30^{\circ}C \rightarrow 29^{\circ}C \rightarrow 30^{\circ}C \rightarrow 29^{\circ}C \rightarrow 30^{\circ}C \rightarrow (Test operation) \rightarrow Stop$$



11-1-2. Forced Defrost Setup of Remote Controller (For wired remote controller only)

(Preparation in advance)

1 Push ⊕ + ⊕ + ⊕ buttons simultaneously for 4 seconds or more on the remote controller. (Push buttons while the air conditioner stops.)

The first displayed unit No. is the master indoor unit address in the group control.

2 Every pushing button, the indoor unit No. in the group control is displayed one after the other.

Select a main indoor unit (outdoor unit is connected) which is to be defrosted. In this time, fan and louver of the selected indoor unit operate.

- **3** Using the set temperature buttons, specify the item code (DN) 8C.
- **4** Using the timer time **▼** a buttons, set time to data 0001. (0000 at shipment)
- **5** Push ^{SET} button. (OK if indication lights)
- **6** Pushing button returns the status to the normal stop status.

(Practical operation)

- Push ON/OFF (UON/OFF) Key.
- Select the HEAT mode.
- After while, the forced defrost signal is sent to the outdoor unit and then the outdoor unit starts defrost operation. (The forced defrost operation is performed for Max. 12 minutes.)
- After defrost operation finished, the operation returns to the heating operation.

To execute the defrost operation again, start procedure from above item $m{1}$.

(If the forced defrost operation was executed once, setting of the above forced defrost operation is cleared.)

11-1-3. LED Display on P.C. Board

1. D501 (Red)

- It goes on (Goes on by operation of the main microcomputer) at the same time when the power supply is turned on.
- It flashes with 1-second interval (every 0.5 second): When there is no EEPROM or writing-in operation fails.
- It flashes with 10-seconds interval (every 5 second): During DISP mode
- It flashes with 2-seconds interval (every 1 second): While setting of function select (EEPROM)

2. D403 (Red)

• It goes on when power supply of the remote controller is turned on. (Lights on hardware)

3. D503 (Yellow): Main bus communication

It goes on for 5 seconds in the first half of communication with the central controller.

4. D504 (Green): Sub bus communication

- It flashes for 5 seconds in the first half of communication with the remote controller. (Group master unit)
- It flashes with 0.2-second interval (for 0.1 second) for 5 second in the latter half of communication between master and follower in the Gr indoor unit.

5. D14 (Orange)

• It flashes while receiving the serial signal from the outdoor unit. (Hardware)

6. D15 (Green)

• It flashes while sending the serial signal to the outdoor unit. (Hardware)

11-1-4. Function Selection Setup

<Pre><Pre>cedure> Perform setting while the air conditioner stops.

1 Push (**) + (**) + (**) buttons simultaneously for 4 seconds or more.

The first displayed unit No. is the master indoor unit address in the group control. In this time, fan and louver of the selected indoor unit operate.

Û

2 Every pushing button (button at left side), the indoor unit No. in the group control is displayed one after the other. In this time, fan and louver of the selected indoor unit only operate.

Д

 ${f 3}$ Using the set temperature ${\bf J}^{\rm TEMP}$ buttons, specify the item code (DN).

4 Using the timer time \bigcirc buttons, select the set data.

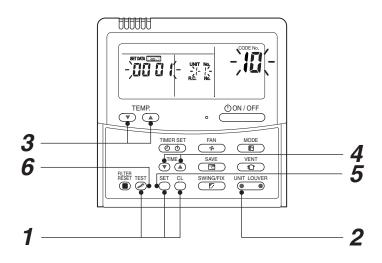
①

5 Push $\stackrel{\text{\tiny SET}}{\bigcirc}$ button. (OK if indication lights)

- ullet To change the selected indoor unit, proceed to Procedure $oldsymbol{2}$.
- To change item to be set up, proceed to Procedure $oldsymbol{3}$.

Û

6 Pushing button returns the status to the normal stop status.



<Operation procedure>

$$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$$
 END

Function selection item No. (DN) list

| DN | Item | | Contents | At shipment from factory |
|----|--|---|---|--------------------------------------|
| 01 | Filter sign lighting time | 0000: None
0002: 2500H
0004: 10000H | 0001: 150H
0003: 5000H
0005: Clogging sensor used | According to type |
| 02 | Filter stain level | 0000: Standard
0001: Heavy stain (Half of sta | andard time) | 0000: Standard |
| 03 | Central control address | 0001: No.1 unit to 0099: Undecided | 0064: No.64 unit | 0099: Undecided |
| 06 | Heating suction temp. shift | 0000: No shift
0002: +2°C to | 0001: +1°C
0010: +10°C
(Up to +6 is recommended.) | 0002: +2°C
(Floor type 0000: 0°C) |
| 0F | Cooling-only | 0000: Heat pump
0001: Cooling only (No displa | ay for [AUTO] [HEAT]) | 0000: Heat pump |
| 10 | Туре | 0000: (1-way air discharge ca | | According to model type |
| 11 | Indoor unit capacity | 0000: Undecided | 0001 to 0034 | According to capacity type |
| 12 | Line address | 0001: No.1 unit to | 0030: No.30 unit | 0099: Undecided |
| 13 | Indoor unit address | 0001: No.1 unit to | 0064: No.64 unit | 0099: Undecided |
| 14 | Group address | 0000: Individual
0002: Follower unit in group | 0001: Master unit in group | 0099: Undecided |
| 19 | Louver type
(Adjustment of air direction) | 0000: No louver model
(0002:1-way)
0004: 4-way | 0001: Swing only
(0003:2-way) | According to model type |
| 1E | In automatic cooling/heating, temp. width of cool \rightarrow heat, heat \rightarrow cool mode selection control point | 0000: 0 deg to (Cool/heat are reversed 2 against the set temper | | 0003: 3 deg
(Ts±1.5) |
| 28 | Automatic reset of power failure | 0000: None | 0001: Provided | 0000: None |
| 2A | Selection of option / error input (CN70) | 0000: Filter input
0002: Humidifier input | 0001: Alarm input
(Air cleaner, etc.) | 0002: Humidifier |
| 2b | Selection of thermostat output (T10 ③) | 0000: Indoor thermostat ON 0001: ON receiving output of | outdoor compressor | 0000: Thermostat ON |
| 2E | Selection of HA (T10) terminal | 0000: Normal (JEMA)
0002: Fire alarm input | 0001: Card input
(Forgotten to be off) | 0000: Normal
(HA terminal) |
| 30 | AUTO grille
(This function is not provided.) | 0000: Impossible | 0001: Possible | 0000: Impossible |
| 31 | Fan (Single operation) | 0000: Impossible | 0001: Possible | 0000: Impossible |
| 32 | Sensor selection | 0000: Body TA sensor | 0001: Remote controller sensor | 0000: Body sensor |
| 40 | Humidifier control
(+Drain pump control)
(This function is not provided.) | 0000: No control
0001: Humidifier + Vaporizing
0002: Humidifier + Supersoni
(Pump ON when specil
0003: Humidifier + Natural dra | ic type
fied time elapsed) | 0003: Humidifier ON
Pump OFF |
| 5d | High ceiling selection
(Air volume selection) | 0000: Standard filter
0001: Super long life
0003: High performance (65%
(0006:Deodorant, Ammonia d | , o . | 0000: Standard |
| 60 | Timer setting (Wired remote controller) | 0000: Operable | 0001: Operation prohibited | 0000: Operable |

| DN | Item | Contents | At shipment from factory |
|----|--|--|--------------------------------------|
| 42 | Self-clean operation time | 0000: None 0000: 0.5 h to 0.012: 0 h Set when compressor-ON time is 10 to 60 minutes. When ON-time is 60 minutes or more, the double of this operation time setting is set. | 0002: 1 hour |
| 45 | Selection of louver horizontal discharge position | 0000: Smudging-less setting
0002: Cold draft preventive setting | 0000: Smudging-
less setting |
| C2 | Current demand X% to outdoor unit | 0050: 50% to 0100: 100% | 0075: 75% |
| СС | Setting of self-clean operation forced stop | O000: No Clean operation is performed in case of stop by HA input. HA operation output OFF during clean operation in case of stop by remote controller O001: Yes Clean operation is not performed in case of stop by HA input. HA operation output ON during clean operation in case of stop by remote controller | 0000: None |
| CD | Clean operation stop function when [ON/OFF] operation is prohibited. | The air conditioner stops (including fire alarm such as remote monitor system) while setup of [ON/OFF] operation prohibited (Central 1, 2) is performed from the central controller side. 0000: Valid (Clean operation) 0001: Invalid (No clean operation) | 0000: Valid |
| D0 | Existence of remote controller save function | 0000: Invalid (Impossible) 0001: Valid (Possible) | 0001: Valid (Possible) |
| D1 | Existence of 8°C heating operation function | 0000: Invalid (Impossible) 0001: Valid (Possible) | 0001: Invalid (Impossible) |
| D3 | Revolution frequency of self clean operation | 0000: Invalid (Self clean operation is not carried out.) 0001: Valid (Self clean operation is practiced with 210 rpm.) | 0001: Valid
(210 rpm / operation) |
| D4 | Display / No display of [Dry operation] during self clean operation | 0000: Display 0001: No display | 0000: Display |
| F0 | Louver swing mode | 0000: No synchronization 0001: 4-way synchronization 0002: Dual 0003: Cycle | 0001: 4-way
synchronization |
| F1 | Louver No.1 fixed position | 0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position | 0000: Release |
| F2 | Louver No.2 fixed position | 0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position | 0000: Release |
| F3 | Louver No.3 fixed position | 0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position | 0000: Release |
| F4 | Louver No.4 fixed position | 0000: Release (Free) 0001 to 0005: Horizontal discharge position to Downward discharge position | 0000: Release |

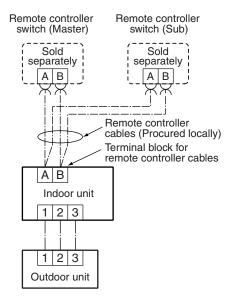
^{*} The swing mode selection (DN code No. [F0]), louver fix (DN code No. [F1] to [F4]) and restriction ratio setting for save operation (DN code No. [C2]) can be set/changed from the normal DN setup (Detail DN setup).

11-1-5. Wiring and Setting of Remote Controller Control

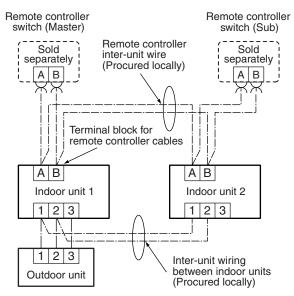
2-remote controller control (Controlled by 2 remote controllers)

This control is to operate 1 or multiple indoor units are operated by two remote controllers. (Max. 2 remote controllers are connectable.)

When connected 2 remote controllers operate an indoor unit



When connected 2 remote controllers operate the twin



(Setup method)

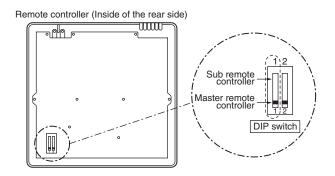
One or multiple indoor units are controlled by 2 remote controllers.

(Max. 2 remote controllers are connectable.)

<Wired remote controller> How to set wired remote controller

as sub remote controller

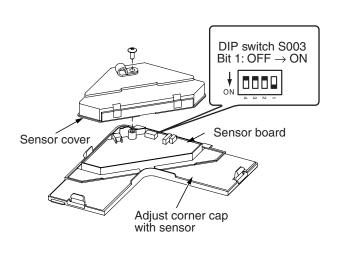
Change DIP switch inside of the rear side of the remote controller switch from remote controller master to sub. (In case of RBC-AMT32E)



<Wireless remote controller>

How to set wireless remote controller to sub remote controller

Change OFF of Bit [3: Remote controller Sub/Master] of switch S003 to ON.



[Operation]

- The operation contents can be changed by Lastpush-priority.
- 2. Use a timer on either Master remote controller or Sub remote controller.

11-1-6. Monitor Function of Remote Controller Switch

■ Calling of sensor temperature display

<Contents>

Each data of the remote controller, indoor unit and outdoor unit can be understood by calling the service monitor mode from the remote controller.

<Procedure>

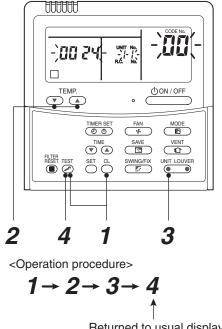
1 Push $\stackrel{\text{TEST}}{\cancel{>}}$ + $\stackrel{\text{CL}}{\bigcirc}$ buttons simultaneously for 4 seconds to call the service monitor mode.

The service monitor goes on, the master indoor unit No. is displayed at first and then the temperature of item code \mathcal{GG} is displayed.



2 Push temperature set ** buttons and then change the item code of data to be monitored.

The item code list is shown below.



Returned to usual display

| | Item code | Data name | Unit |
|----------|-----------|--|-------|
| | 01 | Room temperature (Remote controller) | °C |
| l a | 02 | Indoor suction temperature (TA) | °C |
| nit data | 03 | Indoor heat exchanger (Coil) temperature (TCJ) | °C |
| or unit | 04 | Indoor heat exchanger (Coil) temperature (TC) | °C |
| Indoor | 07 | Indoor fan revolution frequency | rpm |
| - | F2 | Indoor fan calculated operation time | ×100h |
| | F3 | Filter sign time | ×1h |
| | F8 | Indoor discharge temperature*1 | °C |
| | | | |

| | Item code | Data name | Unit |
|---------|-----------|--|-------|
| | 60 | Outdoor heat exchanger (Coil) temperature (TE) | °C |
| | 61 | Outside temperature (TO) | °C |
| data | 62 | Compressor discharge temperature (TD) | °C |
| | 63 | Compressor suction temperature (TS) | °C |
| unit | 65 | Heat sing temperature (THS) | °C |
| ğ | 6A | Operation current | Α |
| Outdoor | 6D | Outdoor heat exchanger (Coil) temperature (TL) | °C |
| Ιõ | 70 | Compressor operation frequency | rps |
| | 72 | Outdoor fan revolution frequency (Lower) | rpm |
| | 73 | Outdoor fan revolution frequency (Upper) | |
| | F1 | Compressor calculated operation time | ×100h |



Push button to select the indoor unit to be monitored. Each data of the indoor unit and its outdoor units can be monitored.



- **4** Pushing button returns the status to the usual display.
 - *1 The indoor discharge temperature of item code [F8] is the estimated value from TC or TCJ sensor. Use this value to check discharge temperature at test run. (A discharge temperature sensor is not provided to this model.)
 - The data value of each item is not the real time, but value delayed by a few seconds to ten-odd seconds.
 - If the combined outdoor unit is one before 2 or 3 series, the outdoor unit data [6D], [70], [72] and [73] are not displayed.

■ Calling of error history

<Contents>

The error contents in the past can be called.

<Procedure>

1 Push ○ + ② buttons simultaneously for 4 seconds or more to call the service check mode.

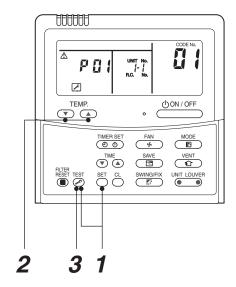
Service Check goes on, the **item code 01** is displayed, and then the content of the latest alarm is displayed. The number and error contents of the indoor unit in which an error occurred are displayed.

2 In order to monitor another error history, push the set temperature v/ buttons to change the error history No. (Item code).

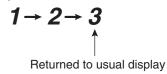
Item code \mathcal{O}' (Latest) \rightarrow Item code \mathcal{O}' (Old)

NOTE: 4 error histories are stored in memory.

3 Pushing [™] button returns the display to usual display.



<Operation procedure>



REQUIREMENT

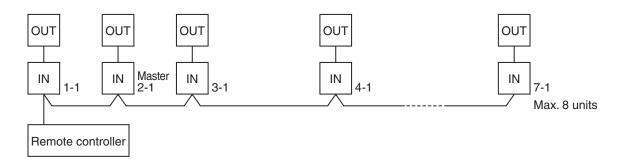
Do not push $\stackrel{\text{CL}}{\bigcirc}$ button, otherwise all the error histories of the indoor unit are deleted.

(Group control operation)

In a group control, operation of maximum 8 indoor units can be controlled by a remote controller.

The indoor unit connected with outdoor unit (Individual/Master of twin) controls room temperature according to setting on the remote controller.

<System example>



1. Display range on remote controller

The setup range (Operation mode/Air volume select/Setup temp) of the indoor unit which was set to the master unit is reflected on the remote controller.

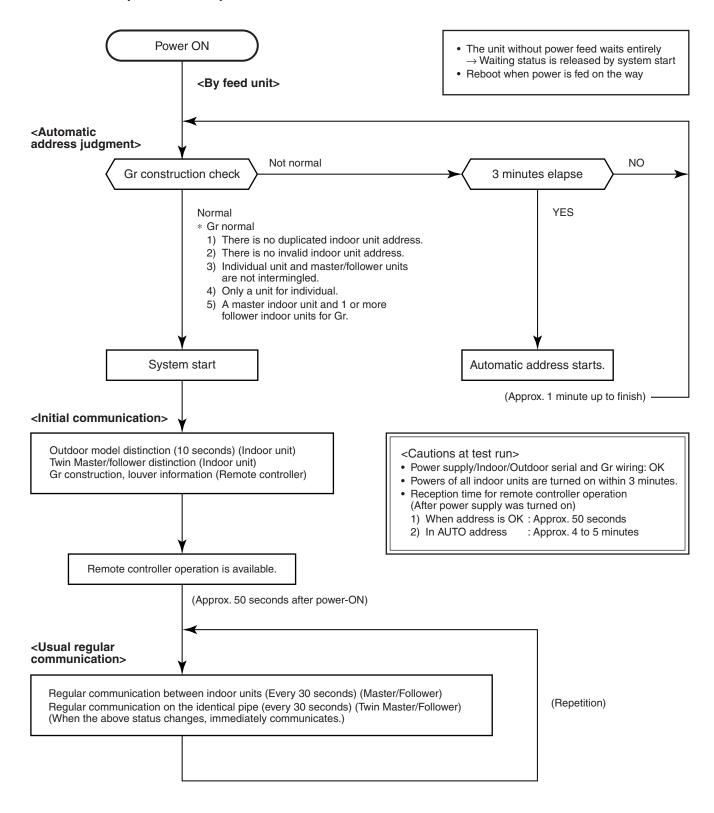
2. Address setup

Turn on power of the indoor unit to be controlled in a group within 3 minutes after setting of automatic address.

If power of the indoor unit is not turned on within 3 minutes (completion of automatic address setting), the system is rebooted and the automatic address setting will be judged again.

- 1) Connect 3 In/Out cables surely.
- 2) Check line address/indoor address/group address of the unit one by one.
- 3) The unit No. (line/indoor gout address) which have been set once keep the present status as a rule if the unit No. is not duplicated with one of another unit.

■ Indoor unit power-ON sequence



- In a group operation, if the indoor unit which was fed power after judgment of automatic address cannot receive
 regular communication from the master unit and regular communication on identical pipe within 120 seconds after
 power was turned on, it reboots (system reset).
 - → The operation starts from judgment of automatic address (Gr construction check) again. (If the address of the master unit was determined in the previous time, the power fed to the master unit and reboot works, the master unit may change though the indoor unit line address is not changed.)

11-2. Setup at Local Site / Others

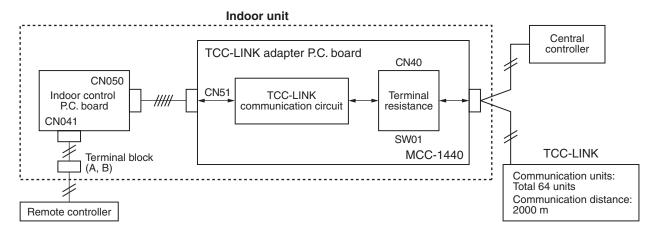
Model name: TCB-PCNT30TLE2

11-2-1. TCC-LINK Adapter (For TCC-LINK Central Control)

1. Function

This model is an optional P.C. board to connect the indoor unit to TCC-LINK (Central controller).

2. Microprocessor block diagram

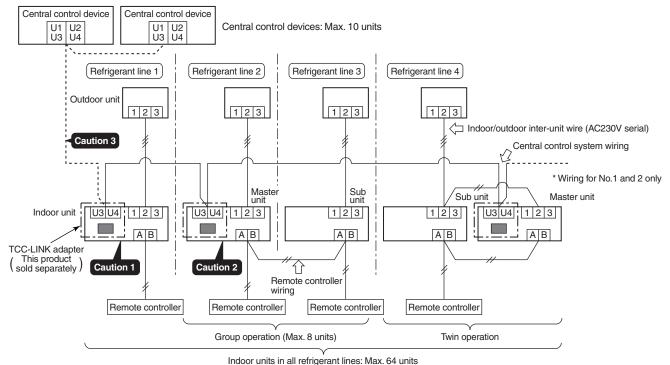


3. TCC-LINK wiring connection

CAUTION

- 1) When controlling customized setup collectively, TCC-LINK adapter (This option) is required.
- 2) In case of group operation or twin/triple operation, the adapter is necessary to be connected to the main unit.
- 3) Connect the central control devices to the central control system wiring.
- 4) When controlling collectively customized setup only, turn on only Bit 1 of SW01 of the least line of the system address No. (OFF when shipped from the factory)

In case of customized setup, the address is necessary to be set up again from the wired remote controller after automatic addressing.



[If mixed with multi model (Link wiring), multi indoor units are included.]

* However group sub units and twin sub units of customized setup are not included in number of the units.

4. Wiring specifications

- Use 2-core with no polar wire.
- · Match the length of wire to wire length of the central control system.

If mixed in the system, the wire length is lengthened with all indoor/outdoor inter-unit wire length at side.

- To prevent noise trouble, use 2-core shield wire.
- · Connect the shield wire by closed-end connection and apply open process (insulating process) to the last terminal. Ground the earth wire to 1 point at indoor unit side. (In case of central controlling of digital inverter unit setup)

CAUTION

1) Closed-end connection of shield wire (Connect all the connecting parts of each indoor unit)

No. of wires

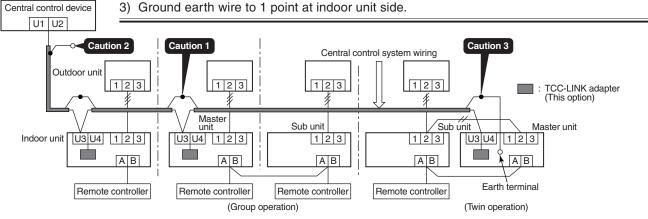
2

Size

Up to 1000m: twisted wire 1.25mm²

Up to 2000m: twisted wire 2.0mm²

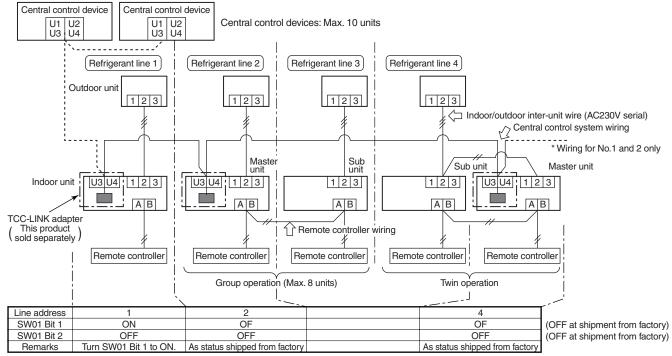
- 2) Apply open process to the last terminal (insulating process).
- 3) Ground earth wire to 1 point at indoor unit side.



5. P.C. board switch (SW01) setup

When performing collective control by customized setup only, the setup of terminator is necessary.

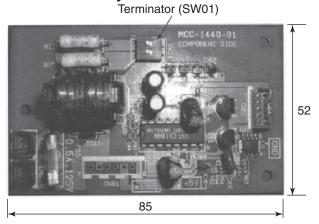
- Using SW01, set up the terminator.
- Set up the terminator to only the adapter connected to the indoor unit of least line address No.



(Reference) Setup contents of switch

| SW01 | | Terminator | Remarks | |
|----------|-------|--|--|--|
| Bit 1 | Bit 1 | Terminator | nelidiks | |
| OFF | OFF | None Mixed with multi (Link wiring) at shipment from factory | | |
| ON | OFF | 100Ω | Central control by digital inverter only | |
| OFF | ON | 75Ω | Spare | |
| ON ON 43 | | 43Ω | Spare | |

6. External view of P.C. board assembly



7. Address setup

In addition to set up the central control address, it is necessary to change the indoor unit number. (Line/Indoor/Group address).

For details, refer to TCC-LINK Adapter Installation Manual.

11-3. How to Set up Central Control Address Number

When connecting the indoor unit to the central control remote controller using TCC-LINK adapter, it is necessary to set up the central control address number.

• The central control address number is displayed as the line No. of the central control remote controller.

1. Setup from remote controller at indoor unit side

* If you use the network adapter P.C. board, it is effective only when No. 7 of setup switch SW01 on P.C. board is turned off.

<Procedure> Perform setup while the unit stops.

1 Push \cancel{E} + \cancel{e} buttons for 4 seconds or more.

When group control is executed, first the unit No. *FLL* is displayed and all the indoor units in the group control are selected. In this time, fans of all the selected indoor units are turned on. **(Fig. 1)** (Keep *FLL* displayed status without pushing button.)

In case of individual remote controller which is not group-controlled, Line address and Indoor unit address are displayed.

- **2** Using temperature setup $\overset{\text{\$}\text{TEMP}}{\overset{\text{\bullet}}{\checkmark}}$ buttons, specify item code $\partial \mathcal{F}$.
- 3 Using timer time buttons, select the setup data. The setup data is shown in the table below (Table 1).
- **4** Push ^{set} button. (OK if display goes on.)

(Fig.1)

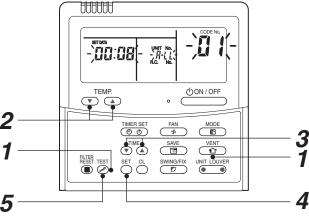
• To change the item to be set up, return to Procedure $oldsymbol{2}$.

5 Push 🕦 button.

The status returns to usual stop status.

(Table 1)

| Setup data | Central control address No. |
|------------|--|
| 0001 | 1 |
| 0002 | 2 |
| 0003 | 3 |
| : | : |
| 0064 | 64 |
| 0099 | Unset (Setup at shipment from factory) |



2. How to confirm the central control address (New function for AMT32 remote controller)

<Procedure> It can be confirmed even during operation or stopping.

 $\textbf{1} \quad \text{Push} \stackrel{\text{\tiny{UNIT LOUVER}}}{\stackrel{\text{\tiny{UNIT LOUVER}}}{\stackrel{\text{\tiny{UNIT LOUVER}}}{\stackrel{\text{\tiny{UNIT LOUVER}}}{\stackrel{\text{\tiny{UNIT LOUVER}}}{\stackrel{\text{\tiny{UNIT LOUVER}}}}} \text{ button for 4 seconds or more.}$

Û

2 In the frame at left side of the remote controller screen, the lighting set contents are displayed.

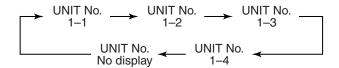
During unset time, 2099 (At shipment from factory) is displayed.

Û

 $oldsymbol{3}$ After lighting display for 3 seconds, the display automatically disappears.

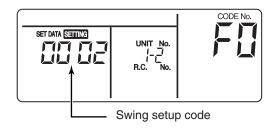
If any button is pushed during display, immediately the display disappears and then the pushed button is displayed.

- 3. How to set up type of swing
- 1 Push for 4 seconds or more during stop of the operation.
 - SETTING flashes.
- **2** Push (At the left side of the button) and select the unit to be selected.
 - Every pushing the button, the unit No. changes.



The fan of the selected unit rotates and the louver swings.

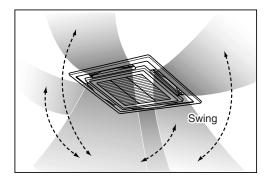
3 Using TIMER SET **▼** / **△** buttons, select type of the swing.



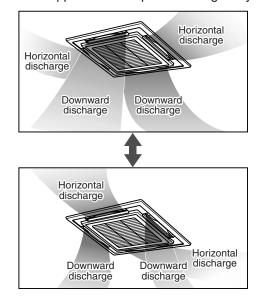
| Swing setup code | Louver operation |
|------------------|------------------------------|
| 0001 | Standard swing (At shipment) |
| 0002 | Dual swing |
| 0003 | Cycle swing |

REQUIREMENT

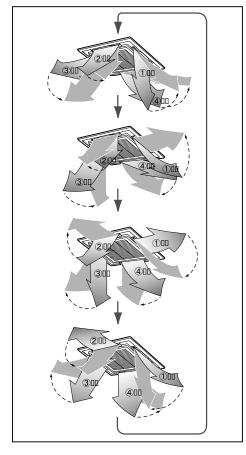
- Do not set 0000. (Louver may cause a trouble.)
- **4** Push $\stackrel{\text{SET}}{\bigcirc}$.
- **5** Push $\stackrel{\text{TEST}}{\mathscr{E}}$ to finish the setup.
 - Standard swing
 Four louvers swing simultaneously with the same angel.



- Dual swing (Recommended for heating operation)
 - The adjoined louvers repeat horizontal discharge/Downward discharge alternately to clear irregularity of the temperature in heating operation.
 - The vertical discharge spreads hot air to the floor, and the horizontal discharge stirs.
 Both suppress the temperature irregularity.

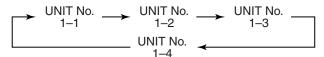


- * Cycle swing (Recommended for cooling operation)
 - 4 louvers swing with time lag as if they heave.



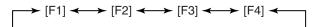
4. How to set louver lock (Louver fix)

- 1 Push (At the right side of the button) for 4 seconds or more during stop of the operation.
 - SETTING flashes.
- **2** Push (At the left side of the button) and select the unit to be set.
 - Every pushing the button, the unit No. changes.

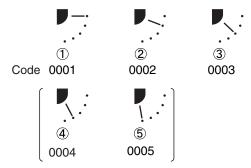


The fan of the selected unit rotates and the louver swings.

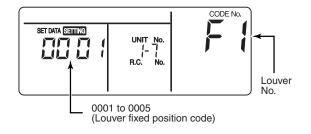
- 3 Push temp. set ▼ / ▲ to display the louver No. of which air direction is to be fixed.
 - The selected louver swings.



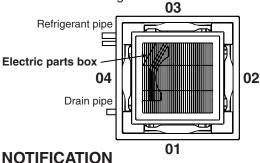
4 Push TIMER SET ▼ / ▲ and select air direction of the louver of which swinging you do not want.



- * If selecting above ④ and ⑤, there may be fear of dewing in cooling time.
- **5** Push $\stackrel{\text{set}}{\bigcirc}$ to determine the setup contents.
 - When the setup was determined, mark goes on.
 To set continuously the louver lock of the other unit, repeat operations from 2 but from 3 to set the other louver lock in the same unit, respectively.
- **6** Push $\stackrel{\text{TEST}}{\cancel{\mathcal{E}}}$ to finish the setup.



* F1 displayed at the item code on the remote controller means that the 01 louver was selected as shown in the figure.



- Even if louver lock works, the louver temporarily moves in the following cases.
 - 1) During stop
 - 2) At start of heating operation
 - 3) During defrost operation
 - 4) During thermostat OFF

5. How to clear louver lock

In the item 4 of the louver lock setup procedure, set the air direction to 0000.



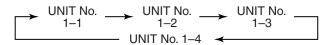
• # mark goes off.

The operations from 1 to 3, 5 and Code 0000 6 are same as those of the louver lock.

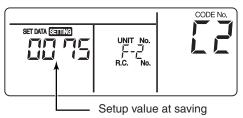
6. How to set contents of save operation

In combination with outdoor units before 4 series, the displayed setup value exchanges, but the real operation is "75% fixed".

- Push for 4 seconds or more during stop of the operation.
 - SETTING flashes.
- **2** Push (At the left side of the button) and select the unit to be set.
 - Every pushing the button, the unit No. changes.
 The fan of the selected unit rotates and the louver swings.



- **3** Determine the capacity restricted value when pushing the save button of TIMER SET ▼ / ▲.
 - Every pushing the button, the capacity restricted value can be set at 1% interval in the range between 100% and 50%.
 - * The setting at shipment is 75%.



4 Push $\stackrel{\text{SET}}{\bigcirc}$ and then push $\stackrel{\text{TEST}}{\cancel{\mathcal{E}}}$ to finish the setup.

11-4. Outdoor Unit

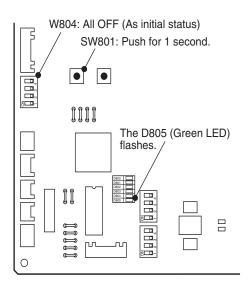
11-4-1. Refrigerant Recovery Control

The "ozone destruction coefficient" of HFC refrigerant is 0 and the discharge regulation is set as anathermal effect gas.

To this model, a switch which can perform the refrigerant recovery (pump down) by the outdoor unit is mounted so that it is easy to react against the environment at reinstalling or rejection time.

[Operation method]

- 1) Set the mode of the indoor unit to fan mode.
- Set all DIP switch SW804 to OFF (Initial status) and then push the button switch SW801 for approx. 1 second. The cooling operation starts. (During this time, D805 (Green LED) flashes.) This operation finishes by 10 minutes.
- 3) After operation for 3 minutes or more, close valve at liquid side.
- 4) After recovery of refrigerant, close valve at gas side.
- 5) Push the button switch SW801 again for approx. 1 second. The outdoor unit stops.
- 6) Stop the indoor unit and then turn off the power supply.



11-4-2. Various setting on outdoor unit (Existing piping, Power save, Cooling-only, etc.)

The following settings are available by DIP switch setup and jumper line setup.

| Function | | Set position | | C | Control co | ntents | | |
|----------------------------|----------------------------|---|---|---|--------------------------------------|-------------|------------------------|--------------|
| High static pressure setup | SW802 | | po
ou
Th
(M | rn the switch to ON what of the outdoor unit. tdoor fan tap. e operation is perform ax: Upper fan: 890 rprothis case, the outdoor | Add 3 tap:
ed with
n / Lower f | s to the u | pper limit
om (WF)) | value of the |
| Existing piping setup | 6.400T | High static pressure setup Existing piping setup | In this case, the heating capacity may lower according to outside | | | | | |
| Power save setup | 0
 | Power save setup Snow-proof fan control | Turn the switch to ON when using the power save function. The control to lower the compressor frequency (Approx. –10%) is performed by indoor heat exchanger temp. in heating operation. | | | | | |
| Snow-proof fan control | * all are OFF at shipment. | | When snow enters from clearance of the fan guard or heat exchanger into blast path and it is accumulated, the control to prevent generation of motor lock is validated. When outside temp. is below 0°C though the compressor stops, the outdoor fan operates with W5. | | | | | |
| Defrost time change | | J805, J806 | The defrost interval is cut to shorten it than the standard status. For contents of control and cutting method, refer to Section 8-2-10. Defrost control. | | | ard status. | | |
| May fraguency | | | When it is needed to lower the maximum value of the compressor frequency, cut the jumper line. Max. frequency at cooling/heating is lowered. In this case the Max. capacity decreases. Max. frequency of compressor | | | | | |
| Max. frequency change | | J807 | | Model | RAV-S | RAV-SP1104 | | P1404 |
| | | | | Model | COOL | HEAT | COOL | HEAT |
| | | | | Standard status | 53.4 | 71.4 | 64.2 | 90.6 |
| | | | | When J807 is cut | 53.4 | 64.2 | 64.2 | 72.0 |
| Cooling-only setup | | J808 | When using the air conditioner as a cooling-only conditioner, the jumper line.(An air conditioner can be changed to cooling only conditioner by "0F" of DN code on the remote controller.) | | | cooling- | | |

11-4-3. Service Support Function (LED Display, Switch Operation)

1. Outline

A various setup and operation check can be performed by DIP switches at 3 positions (SW802, SW803, SW804) and the pushdown button switches (SW800, SW801) at 2 positions.

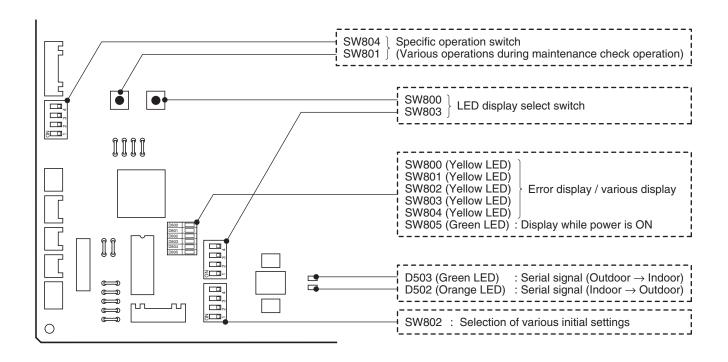
Operation part

| Part No. | Specifications | Operation contents |
|--|------------------------|---|
| SW800 | Pushdown button switch | Exchanges the displayed contents of LED (D800 to D804) on the outdoor |
| SW803 | DIP switch | control P.C. board. |
| SW801 | Pushdown button switch | Deuferment the execution to already register and |
| SW804 | DIP switch | Performs the specific operation to check maintenance. |
| SW802 DIP switch Performs various initial settings. (Refer to 11-4-2.) | | Performs various initial settings. (Refer to 11-4-2.) |

Display part

| Part No. | Part No. Specifications Operation contents | |
|----------------|--|--|
| | | Indoor/Outdoor communication (Serial communication) signal display (Receive signal from indoor signal) |
| D503 | D503 Green LED Indoor/Outdoor communication (Serial communication) signal displ
(Send signal from outdoor signal) | |
| D800 to D804 | Yellow LED | Error display When all SW803 are OFF, or when any of D800 to D804 goes on, LED displays that the outdoor controller detects an error. When status of SW803 is other than OFF, various indications are displayed. |
| Dood Green LED | | Power-ON display When the power of the outdoor unit is turned on, LED goes on. When SW801 and SW804 operate the specific operation, LED flashes. |

^{*} All LED are colorless when it goes off.



11-4-4. Others

1. Selection of LED display (SW800, SW803 operation)

1) Display selection list

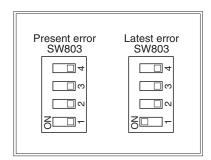
The displayed contents of LED D800 to D804 on the outdoor control P.C. board can be exchanged by operation of SW803.

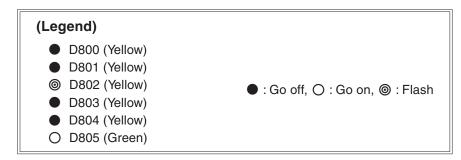
| Switch | Function / Contents | Refer |
|--|--|-----------------------|
| NO | Error display (Error generating at present) Error generating at present is displayed. This switch goes off when an error does not generate. | Refer to
Page 125. |
| SM803 | Error display (The latest error: Latest error including present) After error status was cleared, the error which generated before can be confirmed by this setting. (Reconfirmation is available even if power supply was turned off once.) If an error generates at present, the same contents as those of error which is generating at present are displayed. Only error of TO sensor is not displayed by this setting. (Confirm it by setting of error which is generating at present.) | Refer to
Page 125. |
| TD TE TS SW803 SW8 | Temperature sensor display The detected value of temperature sensor is displayed. | Refer to
Page 126. |
| SM803 | Current display The current value which flows in the outdoor unit is displayed. | Refer to
Page 126. |
| SM803 | Compressor operation frequency display The operation frequency of the compressor is displayed. | Refer to
Page 126. |
| S | PMV opening display The opening of PMV (Pulse Motor Valve) is displayed. | Refer to
Page 126. |

2) Error display

The error which is generating at present and the latest error (Latest error information including present) can be confirmed by lighting LED D800 toD804 on the outdoor control P.C. board.

- a) When all DIP switch SW803 are OFF, the status of error which is generating at present is displayed.
- b) <1> only of DIP switch SW803 is turned on, the error which generated before (Latest error information including present) is displayed.a)
- c) If there is an error, any of LED D800 to D804 goes on. (Display 1)
- d) When pushing the pushdown button switch SW800 for approx. 1 second, the display is exchanged. (Display 2)
- e) When pushing SW800 again or after 2 minutes, the status returns to that of Display ①.





| Display 1)
(Initial display) | Display 2)
(SW800 operation) | Error contents | Wired remote controller
Error code |
|---------------------------------|---------------------------------|--|---------------------------------------|
| •••• | ••••• | Normal | _ |
| | | Discharge temp. sensor (TD) error | F04 |
| | | Heat exchanger temp. sensor (TE) error | F06 |
| | 000000 | Heat exchanger temp. sensor (TL) error | F06, F07 |
| 00000 | | Outside temp. sensor (TO) error | F08 |
| | | Suction temp. sensor (TS) error | F06, F12 |
| | ⊚●⊚⊚●○ | Heat sink temp. sensor (TH) error | F13, L29 |
| | 000000 | Heat exchanger sensor (TE, TS) miswiring | F06, F15 |
| | 00000 | EEPROM error | F31, L29 |
| | 00000 | Compressor break down | H01 |
| ••0•00 | | ● ◎ ● ● ○ Compressor lock H02 | H02 |
| | 000000 | Current detection circuit error | H03 |
| | | Case thermostat operation | H04, P04 |
| | | Model unset | L10, L29 |
| ●00●00 | 00000 | Communication error between MCU | L29 |
| | 00000 | Other error (Compressor disorder, etc.) | Error is not determined. |
| | 00000 | Discharge temp. error | P03 |
| | | Power supply error | P04, P05 |
| | 000000 | Heat sink overheat error | P07, L29 |
| | 000000 | Gas leak detection | P15, L29 |
| 000000 | 00000 | 4-way valve reverse error | P19, L29 |
| | ●●◎●◎○ | High pressure protective operation | P04, P20 |
| | ●◎◎●◎○ | Fan system error | P22 |
| | ●◎●◎◎○ | Driving element short-circuit | P26 |
| | @●@@@○ | Position detection circuit erro | P29 |

^{*} As the error code displayed on the wired remote controller may differ according to type of indoor model, multiple codes are described.

3) Sensor, current, compressor operation frequency, PMV opening display

The values detected by the controller, such as temperature sensor or current value are simply confirmed.

| (Legend) | | |
|-----------------------------------|---------------------------------|-----------------------|
| D800 (Yellow) | D803 (Yellow) | |
| D801 (Yellow) | D804 (Yellow) | ● : Go off, ○ : Go on |
| D802 (Yellow) | O D805 (Green) | |

| | Temperature sensor (°C) | _ | Compressor | PMV |
|----------------|---|----------------|---------------------|--------------|
| Item | TD TE TS TO TL
SW803 SW803 SW803 SW803 | Current
(A) | operation frequency | opening |
| setup | 34402 34402 34402 34402 34402 | (7.1) | (rpm) | (Pulse) |
| | | | | |
| | | SW803 | SW803 | SW803 |
| | | | | |
| | TH TA TC TCJ
SW803 SW803 SW803 SW803 | 3 | 3 | 3 |
| | | 80 | Non- | Non- |
| LED
display | | | | |
| display | | | | |
| ••••• | Below –25 | 0 to 0.9 | 0 to 4 | 0 to 19 |
| 00000 | −25 to −21 | 1 to 1.9 | 5 to 9 | 20 to 39 |
| •0•••0 | −20 to −16 | 2 to 2.9 | 10 to 14 | 40 to 59 |
| 00000 | −15 to −11 | 3 to 3.9 | 15 to 19 | 60 to 79 |
| ••0••0 | −10 to −5 | 4 to 4.9 | 20 to 24 | 80 to 99 |
| 00000 | −5 to −1 | 5 to 5.9 | 25 to 29 | 100 to 119 |
| ●00●●0 | 0 to 4 | 6 to 6.9 | 30 to 34 | 120 to 139 |
| 00000 | 5 to 9 | 7 to 7.9 | 35 to 39 | 140 to 159 |
| | 10 to 14 | 8 to 8.9 | 40 to 44 | 160 to 179 |
| 00000 | 15 to 19 | 9 to 9.9 | 45 to 49 | 180 to 199 |
| | 20 to 24 | 10 to 10.9 | 50 to 54 | 200 to 219 |
| 00000 | 25 to 29 | 11 to 11.9 | 55 to 59 | 220 to 239 |
| ●●○○●○ | 30 to 34 | 12 to 12.9 | 60 to 64 | 240 to 259 |
| 00000 | 35 to 39 | 13 to 13.9 | 65 to 69 | 260 to 279 |
| ●000●0 | 40 to 44 | 14 to 14.9 | 70 to 74 | 280 to 299 |
| 00000 | 45 to 49 | 15 to 15.9 | 75 to 79 | 300 to 319 |
| ••••00 | 50 to 54 | 16 to 16.9 | 80 to 84 | 320 to 339 |
| 00000 | 55 to 59 | 17 to 17.9 | 85 to 89 | 340 to 359 |
| ●○●●○○ | 60 to 64 | 18 to 18.9 | 80 to 84 | 360 to 379 |
| 00000 | 65 to 69 | 19 to 19.9 | 95 to 99 | 380 to 399 |
| ••0•00 | 70 to 74 | 20 to 20.9 | 100 to 104 | 400 to 419 |
| 00000 | 75 to 79 | 21 to 21.9 | 105 to 109 | 420 to 439 |
| ●00●00 | 80 to 84 | 22 to 22.9 | 110 to 114 | 440 to 459 |
| 000000 | 85 to 89 | 23 to 23.9 | 115 to 119 | 460 to 479 |
| •••000 | 90 to 94 | 24 to 24.9 | 120 to 124 | 480 to 499 |
| 0 000 | 95 to 99 | 25 to 25.9 | 125 to 129 | 500 |
| •0•000 | 100 to 104 | 26 to 26.9 | 130 to 134 | _ |
| 00000 | 105 to 109 | 27 to 27.9 | 135 to 139 | _ |
| ••0000 | 110 to 114 | 28 to 28.9 | 140 to 144 | - |
| 00000 | 115 to 119 | 29 to 29.9 | 145 to 149 | <u> </u> |
| •00000 | Over 120 | 30 to 30.9 | 150 to 154 | <u> </u> |
| 000000 | Sensor error, unconnected | Over 31 | Over 155 | _ |

^{*} As TD, TL and TH are sensors for high temperature, there is error at normal temperature or below position.

^{*} For current value, the current for the outdoor unit only is displayed.

4) Specific operation for maintenance check (SW801, SW804)

The following specific operations for the maintenance check are performed by operation of SW801 or SW804.

- a) Select DIP switch SW804. (See table below)
- b) Push the pushdown button switch SW801 for approx. 1 second.
- c) The following functions start. While each function starts, LED D805 (Green) flashes.
- d) When pushing the pushdown button switch SW801 again for approx. 1 second, when selecting DIP switch SW804 or when the specified time of each function elapsed, each function stops and LED D805 (Green) returns to the continuous lighting.

<Specific operation>

| SW804 | Operation when pushdown button switch SW | 801 is pushed |
|--|---|--|
| SW804 | Refrigerant recovery operation The outdoor unit performs cooling operation. The indoor unit does not work by this operation alone. Therefore operate the fan beforehand. (Refer → 11-4-1. Refrigerant Recovery Control) | |
| N 1 2 2 3 3 3 3 3 3 3 3 | Indoor cooling test run demand The cooling test run is performed. (→ Note 1) | |
| NO | Indoor heating test run demand The heating test run is performed. (→ Note 1) | |
| SW804 | Fan motor forced operation Drive the fan motor forcedly. When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. | |
| SW804 | (No operation especially) | [NOTE] Although these operations can be performed even during operation, basically perform operation while the unit stops. |
| NO | PMV full open operation Open PMV (Pulse Motor Valve) fully. When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. | If performing this operation during driving the unit, it is dangerous because the pressure may change suddenly. |
| NO 1 2 3 6 7 8 8 9 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 | PMV full close operation Close PMV (Pulse Motor Valve) fully. When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. | |
| SM804 | PMV middle opening operation Set PMV (Pulse Motor Valve) to middle opening (250 pulses). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. | |

Note 1) Indoor cooling test run demand / Indoor heating test run demand

Only when combining with the following indoor unit, cooling/heating operation can be performed from the outdoor unit.

Test run is available: Indoor unit of 4 series and after (RAV-SM***4UT-E etc.)

Test run is unavailable: Indoor units other than the above-mentioned indoor units, or indoor units other than above-mentioned indoor units are included in the twin connection.

Note 2) The forced test run by this setting cannot be cleared on the indoor remote controller. Be sure to clear the test run by operation of the outdoor unit. (Push SW801 again for 1 second.)

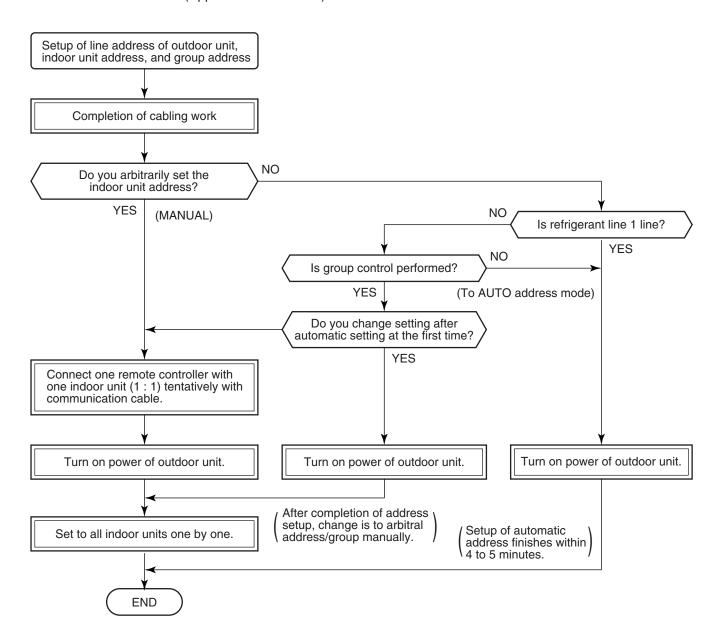
| SW804 | Operation when pushdown button switch SW8 | 301 is pushed |
|-------|--|--|
| SW804 | 4-way valve relay operation (For RY700, CN70 check) Turn on 4-way valve power relay (RY700). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. [NOTE] In case of model adopting the self hold valve (RAV-SP1104AFE, RAV-SP1404T-E), the coil develops fever. Therefore do not perform this operation as coil is connected. | |
| SW804 | Self-hold valve suction operation (Exchange to heating cycle) (For RY700 RY701, RY705, CN701 check) Turn on relay RY700, RY701, RY705. (CN701 between ① and ④ : Voltage=Approx. +198 to 380V) This function works for 10 seconds and then is OFF. | |
| SW804 | Self-hold valve separation operation (Exchange to cooling cycle) Turn on relay RY700. (CN701 between 1) and 4): Voltage=Approx. –198 to 380V) This function works for 10 seconds and then is OFF. | |
| SW804 | SV valve relay operation (For RY702, CN702 check) Turn on SV valve relay (RY702). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. * For R0A-AP1125 to 1605HS, the part is not mounted, so do not operate. | [CAUTION] Although these operations can be performed even during operation, basically perform operation while the unit stops. If performing this operation during driving the unit it is |
| SW804 | Heater output relay operation (For check RY703, CN703 check) Turn on relay for option heater (RY703). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. | during driving the unit, it is dangerous because the pressure may change suddenly. |
| SW804 | Outside output relay operation (RY704, CN704) Turn on relay for outside output (RY704). When pushing SW801 again or when 2 minutes elapsed, the operation returns to the normal control. | |
| SW804 | (No operation especially) | |
| SW804 | Relay operation change for outside output [CAUTION] Do not use this setting. | |

12. ADDRESS SETUP

12-1. Address Setup

<Address setup procedure>

When an outdoor unit and an indoor unit are connected, or when an outdoor unit is connected to each indoor unit respectively in the group operation even if multiple refrigerant lines are provided, the automatic address setup completes with power-ON of the outdoor unit. The operation of the remote controller is not accepted while automatic address works. (Approx. 4 to 5 minutes)



When the following addresses are not stored in the neutral memory (IC10) on the indoor P.C. board, a test run
operation cannot be performed. (Unfixed data at shipment from factory)

| | Item code | Data at shipment | Setup data range |
|---------------------|-----------|------------------|---|
| Line
address | 12 | 0099 | 0001 (No. 1 unit) to 0030 (No. 30 unit) |
| Indoor unit address | 13 | 0099 | 0001 (No. 1 unit) to 0030 (No. 30 unit)
Max. value of indoor units in the identical refrigerant line |
| Group
address | 14 | 0099 | 0000 : Individual (Indoor units which are not controlled in a group) 0001 : Master unit (1 indoor unit in group control) 0002 : Sub unit (Indoor units other than master unit in group control) |

12-2. Address Setup & Group Control

<Terminology>

Indoor unit No. : N - n = Outdoor unit line address N (Max. 30) - Indoor unit address n (Max. 64)

Group address : 0 = Single (Not group control)

1 = Master unit in group control 2 = Sub unit in group control

Master unit (= 1) : The representative of multiple indoor units in group operation sends/receives signals to/from

the remote controllers and sub indoor units. (* It has no relation with an indoor unit which

communicates serially with the outdoor units.)

The operation mode and setup temperature range are displayed on the remote controller

LCD. (Except air direction adjustment of louver)

Sub unit (= 2) : Indoor units other than master unit in group operation

Basically, sub units do not send/receive signals to/from the remote controllers.

(Except errors and response to demand of service data)

Master unit (Representative unit) (Master Twin)

: This unit communicates with the indoor unit (follower) which serial-communicates with the outdoor units and sends/receives signal (Command from compressor) to/from the outdoor units as the representative of the cycle control in the indoor units of the identical line address within the minimum unit which configures one of the refrigerating cycles of Twin.

Follower unit (Subordinate unit) (Follower Twin)

: Indoor units excluding the master unit in Twin

This unit communicates with (Master) indoor unit in the identical line address and performs control synchronized with (Master) indoor unit.

This unit does not perform the signal send/receive operation with the outdoor units. : No judgment for serial signal error.

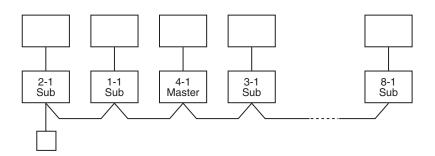
12-2-1. System configuration

1. Single

2. Twin



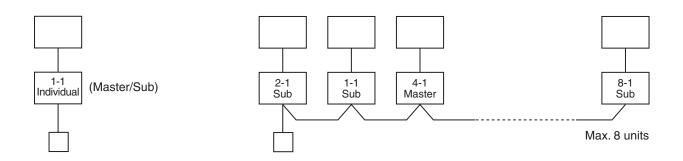
3. Single group operation



12-2-2. Automatic address example from unset address (No miscabling)

- 1. Standard (One outdoor unit)
 - 1) Single

2) Gr operation (Multiple outdoor units = Miltiple indoor units only with serial communication)



Only turning on source power supply (Automatic completion)

12-3. Address Setup

In case that addresses of the indoor units will be determined prior to piping work after cabling work (Manual setting from remote controller)

<Address setup procedure>

- · Set an indoor unit per a remote controller.
- Turn on power supply.

1 Push ^{SET} + ○ + ○ + ② buttons simultaneously for 4 seconds or more.

2 (← Line address)
Using the temperature setup ▼ / ▲ buttons, set /² to the item code.

 $oldsymbol{3}$ Using timer time $oldsymbol{\odot}$ / $oldsymbol{\triangle}$ buttons, set the line address.

4 Push button. (OK when display goes on.)

5 (← Indoor unit address)
Using the temperature setup ▼ / ▲ buttons, set /∃ to the item code.

6 Using timer time **1** / **a** buttons, set 1 to the line address.

7 Push 5 button. (OK when display goes on.)

8 (← Group address)
Using the temperature setup ▼ / ▲ buttons, set / ⁴ to the item code.

9 Using timer time \bigcirc / \bigcirc buttons, set $\partial\partial\partial\partial$ to Individual, $\partial\partial\partial\partial$ to Master unit, and $\partial\partial\partial\partial\partial$ to sub unit.

10 Push [™] button. (OK when display goes on.)

11 Push [™] button.

Setup completes. (The status returns to the usual stop status.)

OUT OUT IN IN Line address \rightarrow 1 $\stackrel{?}{=}$ 2

(Real line: Cabling, Broken line: Refrigerant pipe)

(Example of 2-lines cabling)

For the above example, perform setting by connecting singly the wired remote controller without remote controller inter-unit cable.

Group address

Individual : 0000 Master unit : 0001

Indoor unit address \rightarrow 1 Group address \rightarrow 1

Master unit: 0001 Sub unit: 0002 In case of group control

2, 5, 8

TEMP.

OD 11

TEMP.

TEMP.

OD 11

TEMP.

OD 11

TEMP.

<Operation procedure>

$$1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 10 \rightarrow 11$$
 END

■ Confirmation of indoor unit No. position

1. To know the indoor unit addresses though position of the indoor unit body is recognized

• In case of individual operation (Wired remote controller: indoor unit = 1:1) (Follow to the procedure during operation)

<Procedure>

1 Push button if the unit stops.

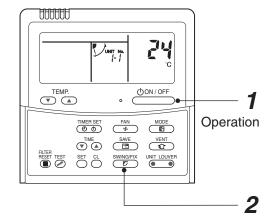
2 Push button.

Unit No. /-/ is displayed on LCD.

(It disappears after several seconds.)

The displayed unit No. indicate line address and indoor unit address.

(When other indoor units are connected to the identical remote controller (Group control unit), other unit numbers are also displayed every pushing button.



<Operation procedure>

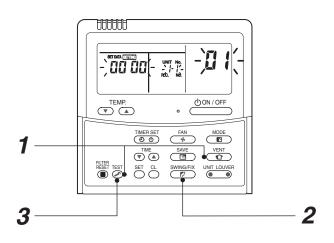
2. To know the position of indoor unit body by address

• To confirm the unit No. in the group control (Follow to the procedure during operation) (in this procedure, the indoor units in group control stop.)

<Procedure>

The indoor unit numbers in the group control are successively displayed, and fan, louver, and drain pump of the corresponding indoor unit are turned on. (Follow to the procedure during operation)

- **1** Push and buttons simultaneously for 4 seconds or more.
 - Unit No. ALL is displayed.
 - Fans and louvers of all the indoor units in the group control operate.
- **2** Every pushing button, the unit numbers in the group control are successively displayed.
 - The unit No. displayed at the first time indicates the master unit address.
 - Fan and louver of the selected indoor unit only operate.
- **3** Push button to finish the procedure. All the indoor units in the group control stop.



<Operation procedure>

<Maintenance/Check list>

Aiming in environmental preservation, it is strictly recommended to clean and maintain the indoor/outdoor units of the operating air conditioning system regularly to secure effective operation of the air conditioner.

It is also recommended to maintain the units once a year regularly when operating the air conditioner for a long time.

Check periodically signs of rust or scratches, etc. on coating of the outdoor units.

Repair the defective position or apply the rust resisting paint if necessary.

If an indoor unit operates for approx. 8 hours or more per day, usually it is necessary to clean the indoor/outdoor units once three months at least.

These cleaning and maintenance should be carried out by a qualified dealer.

Although the customer has to pay the charge for the maintenance, the life of the unit can be prolonged.

Failure to clean the indoor/outdoor units regularly will cause shortage of capacity, freezing, water leakage or trouble on the compressor.

| Part name | Object | | Contents of check | Contents of maintenance |
|------------------------------|--------|---------|---|---|
| Part name | Indoor | Outdoor | Contents of check | Contents of maintenance |
| Heat exchanger | 0 | 0 | Blocking with dust, damage check | Clean it when blocking is found. |
| Fan motor | 0 | 0 | Audibility for sound | When abnormal sound is heard |
| Filter | 0 | _ | Visual check for dirt and breakage | Clean with water if dirty Replace if any breakage |
| Fan | 0 | 0 | Visual check for swing and balance Check adhesion of dust and external appearance. | Replace fan when swinging or balance is remarkably poor. If a large dust adheres, clean it with brush or water. |
| Suction/
Discharge grille | 0 | _ | Visual check for dirt and scratch | Repair or replace it if deformation or damage is found. |
| Drain pan | 0 | _ | Check blocking by dust and dirt of drain water. | Clean drain pan, Inclination check |
| Face panel, Louver | 0 | _ | Check dirt and scratch. | Cleaning/Coating with repair painting |
| External appearance | _ | 0 | Check rust and pealing of insulator Check pealing and floating of coating film | Coating with repair painting |

13. DETACHMENTS

13-1. Indoor Unit

13-1-1. 4-Way Air Discharge Cassette Type

RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

| No. | Part name | Procedure | Remarks |
|-----|----------------------|--|--|
| 1 | Suction grille | CAUTION Be sure to put on the gloves at disassembling work; otherwise an injury will be caused by a part, etc. 1. Detachment | Suction grille Knobs of the suction grille hook Ceiling panel Hook for |
| | | Stop operation of the air conditioner and then turn off switch of the breaker. Slide the 2 knobs of the suction grille inward and then hang down the suction grille. Remove a strap connecting the panel and the suction grille and then remove the suction grille. Attachment | Hole for ceiling panel hook |
| | | 1) Hook the suction grille to the panel. 2) Attach strap of the suction grille to the panel as before. 3) Close the suction grille, slide the knobs outward and then fix the panel. | Hinge |
| 2 | Electric parts cover | Detachment Carry out work of item 1. of ①. Remove the fixing screw A which fixes the electric parts cover and loosen the fixing screw B. Pull down the electric parts cover, remove pin of the bell mouth and then slide it to the arrow direction in order to open the claws and the electric parts box cover. | Bell mouth pin Claw of electric parts box Potbelly hole (Dharma doll hole) Claw of electric parts box cover |
| | | Attachment Close the electric parts cover and slide it, hook claw of the electric parts box, claw of the electric parts box cover and the Dharma doll hole, and then insert pin of the bell mouth into hole of the electric parts box cover. Tighten the fixing screws A and B and then fix the electric parts box cover. Following to work of item 2 of ①, mount the suction grille as before. | Fixing screw A Electric parts box cover |

| No. | Part name | Procedure | Remarks |
|-----|----------------------------------|---|---|
| 2 | Electric parts cover (Continued) | | |
| 3 | Adjust corner cap | 1. Detachment 1) Pull knob of the adjust corner cap to the arrow direction, remove strap of the adjust corner cap from pin of the panel and then remove all the 4 corners of the cap. NOTE: The knob is provided to only one side. Be sure to remove the cap of the knob side at first. 2. Attachment 1) Hook strap of the adjust corner cap securely to pin of the ceiling panel. 2) Insert claw of the adjust corner cap into the square hole of the panel. (2 positions) 3) Push claws of the adjust corner cap into the positions indicated with arrow marks so that they fit in 3 positions. | Adjust corner cap Pulling direction Strap of adjust corner cap Claws (3 positions) Push into positions with arrow marks |

| No. Part name | Procedure | Remarks |
|--------------------------------|---|--|
| No. Part name 4 Ceiling panel | Procedure 1. Detachment 1) Carry out works of item 1 of ② and item 1 of ③. 2) Remove the flap connector (CN510, White, 20P) connected to the control P.C. board and then remove the lead wire from the clamp. NOTE: Unlock the lock of the housing part and then remove the connector. 3) Loosen the panel fixing 4 screws. 4) Slide the panel fixing brackets (4 positions) outward. 5) Push the tentative bracket outward and then remove the ceiling panel. | Clamp Louver motor wiring CN510 Square hole of indoor unit |
| | 2. Attachment 1) Insert the tentative brackets (2 positions) of the ceiling panel into square holes of the indoor unit and then hook the panel tentatively. NOTE: The ceiling panel has the directional properties against the indoor unit. Direct the louver motor wire to the electric parts box side of the indoor unit. 2) Pass the head of the panel fixing screw through hole of the panel fixing bracket and then slide the panel fixing bracket inward. 3) Tighten in the panel fixing screw to fix the ceiling panel. 4) Following to work of item 2 of ③, attach the adjust corner cap as before. 5) Connect the louver connector (CN510, White, 20P) as before and then fix the lead wire with clamp. 6) Following to work of item 2 of ②, mount the electric parts box cover and the suction grille as before. | Panel fixing screw Louver motor wiring Square hole of indoor unit Push in case of removing Tentative bracket Square hole of indoor unit Panel fixing screw Panel fixing bracket Outer side |

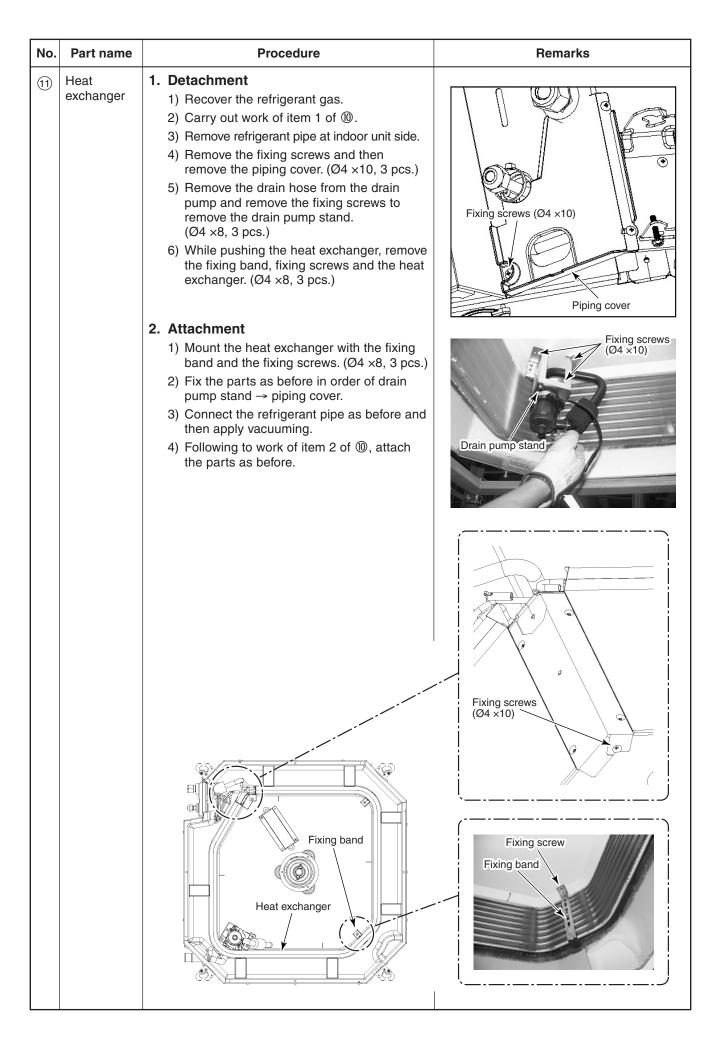
| No. | Part name | Procedure | Remarks |
|-----|-----------------------|--|------------------------|
| § | Control
P.C. board | 1. Detachment 1) Carry out work of item 1 of ②. 2) Remove connectors which are connected from the control P.C. board to the other parts and then remove wiring from the clamp. CN510: Louver motor (20P, White) CN34: Float switch (3P, Red) CN504: Drain pump (2P, White) CN101: TC sensor (2P, Black) CN102: TCJ sensor (2P, Red) CN104: Room temp. Sensor (2P, Orange) CN333: Fan motor power supply (5P, White) CN334: Fan motor position detection (3P, White) NOTE: Unlock the lock of the housing part and then remove the connector. 3) Unlock the locks of the card edge spacer (6 positions) and then remove the control P.C. board. 2. Attachment 1) Fix the control P.C. board to the card edge spacer (6 positions) 2) Connect the connector removed in item 1 as before and then fix the wiring with the clamp. 3) Following to work of item 2 of ③, mount the electric parts box cover and the suction grille as before. | Clamp Cardedge spacer |

| No. Part name | Procedure | Remarks |
|---------------|---|---|
| © Drain cap | Detachment Carry out work of item 1 of ①. Loosen screws (3 positions) fixing the drain cap (outside) and then turn the drain cap to the arrow mark direction to remove it. NOTE: The drain cap is hung down because a strap is attached to it (outside). Loosen the cap by turn the drain cap (inside) for approx. 1 turn to OPEN → direction and then drain the drain water accumulated in the drain pan. NOTE: Be sure to catch drain water using a bucket, etc. when loosening the drain cap. The insulating materials are adhered to the drain cap (outside) and opening part of the drain pan; be careful that they are not come off. If they are come off, stick them as before using double-faces tape, etc. Turn the drain cap once again to OPEN → direction to remove it. Attachment Insert the drain cap (inside), turn it to CLOSE → direction until the position where "Clashed sound" is heard and it cannot be turned more over (Position where A mark of the drain cap (inside)) and then fix it. NOTE: When attaching the drain cap (inside), remove dirt attached to the packing. | CLOSE OPEN Drain cap (inside) CLOSE OPEN Drain cap (inside) CLOSE OPEN Drain cap \(\text{Amark} \) Drain pan \(\text{Amark} \) Drain pan \(\text{Amark} \) |

| No. | Part name | Procedure | Remarks |
|-----|-----------|---|---|
| 7 | Fan motor | Detachment Carry out work of item 1 of ②. Remove connectors which are connected from the control P.C. board to the other parts and then remove each wiring from the clamp. CN510: Louver motor (20P, White) CN34: Float switch (3P, Red) CN504: Drain pump (2P, White) CN101: TC sensor (2P, Black) CN102: TCJ sensor (2P, Red) CN104: Room temp. Sensor (2P, Orange) CN333: Fan motor power supply | Fixing screw A Fixing screw B Electric parts box Clamp |
| | | (5P, White) CN334 : Fan motor position detection (3P, White) NOTE: Unlock the lock of the housing part and then remove the connector. | Fan motor lead TC sensor TCJ sensor |
| | | Remove the fixing screws A and B, and then remove the electric parts box. (Fixing screw A: Ø4 × 10, 3 pcs, Fixing screw B: Ø4 × 8, 1 pc.) Remove the fan motor lead, TC sensor and TCJ sensor from clamp of the bell mouth. Remove the fixing screws and then remove the bell mouth. (Ø4 × 10, 8 pcs.) Remove the fixing screws and then remove the nut cap. (Ø4 × 10, 2 pcs.) Remove the fixing nut and then remove the turbo fan. (M8 nut with flange, 1 pc.) Remove the fixing screws and then remove the motor lead holding bracket. (Ø4 × 8, 2 pcs.) Cut the bundling band and then remove it from the clamp. Remove the fixing nut and then remove | Bell mouth Nut cap Fixing screw Turbo fan |
| | | the fan motor. (Ø6 nut, 3 pcs.) 2. Attachment 1) Fix the parts as before in order of fan motor → motor lead holding bracket → turbo fan → nut cap → bell mouth. NOTE: Fix the motor lead to the clamp without slack as before using bundling band. When fixing the turbo fan, be sure to match the D-cut of the fan boss with D-cut of the motor shaft. Using a torque wrench, fix the turbo fan and tighten it to 5.4 -0.2 Nm. | M8 nut with flange |

| No. | Part name | Procedure | Remarks |
|-----|---------------------------------|--|---|
| No. | Part name Fan motor (Continued) | Procedure 2. Attachment 2) Fix the fan motor lead, TC sensor and TCJ sensor with the clamp of the bell mouth. 3) Mount the electric parts box with the fixing screws A and B. (Ø4 × 10, 3 pcs. Ø4 × 8, 1 pc.) 4) Connect the connector removed in item 1 as before and then fix wiring with the clamp. 5) Following to work of item 2 of ③, mount the electric parts box cover and the suction grille as before. | Fan motor Motor,lead holding bracket Fixing screws (Ø4 x 8) Clamp Fan motor lead |

| No. | Part name | Procedure | Remarks |
|-----|-----------------------|--|--|
| 9 | Float switch assembly | Detachment Carry out works of item 1 of ② and works from 1) to 5). Remove the fixing screw and then remove the float switch assembly. (Ø4 × 25, 1 pc.) Attachment Mount the float switch assembly as before with the fixing screw. NOTE: When mounting, match hole of the float switch assembly with projection of the drain pan. Mount the bell mouth as before. Ø4 × 10, 8 pcs.) Following to works of item 2 of ② and works from 2) to 5), attach the parts as before. | Fixing screw (Ø4 x 25) Hole of float switch assembly Projection of drain pan |
| 100 | Drain pan | Detachment Carry out works of item 1 of ④, item 1 of ⑥, item 1 of ⑦ and works from 2 to 5). Remove the fixing screws to remove the drain pan. (Ø4 ×10, 4 pcs.) Attachment Fix parts as before in order of drain cap → drain pan → bell mouth. Following to works of item 2 of ⑦ and works from 2) to 5), attach parts as before. | Fixing screws (Ø4 ×10) Fixing screws (Ø4 ×10) |



13-2. Outdoor Unit

$\label{eq:rav-sp1104at-e} RAV\text{-}SP1104AT\text{-}E, RAV\text{-}SP1404AT\text{-}E \,/\, RAV\text{-}SP1104ATZ\text{-}E, RAV\text{-}SP1404ATZ\text{-}E \,/\, RAV\text{-}SP1104ATZ\text{-}E, RAV\text{-}SP1404ATZ\text{-}E$

| No. | Part name | Procedure | Remarks |
|-----|-----------------------------|--|-------------|
| No. | Part name Common procedure | CAUTION Never forget to put on the gloves at working time; otherwise an injury will be caused by the parts, etc. 1. Detachment 1) Stop operation of the air conditioner and then turn off switch of the breaker. 2) Remove the front panel. (Hexagonal screw Ø4 × 10, 2 pcs.) • Remove the screws and then remove the front panel by pulling it downward. 3) Remove the power supply cable and the indoor/outdoor connecting wire from the cord clamp and the terminal. | Front panel |
| | | 4) Remove the top plate. (Hexagonal screw Ø4 × 10, 5 pcs.) 2. Attachment 1) Attach the top plate. (Hexagonal screw Ø4 × 10, 5 pcs.) 2) Connect the power supply cable and the indoor/outdoor connecting wire to the terminal and then fix them with the cord clamp. REQUIREMENT For the power supply cable and the indoor/outdoor connecting wire, be sure fix them using the bundling band on the market along the crossover pipe so that they do not come to contact with the compressor, valve at gas side, pipe at gas side and discharge pipe. 3) Attach the front panel. (Hexagonal screw Ø4 × 10, 2 pcs.) | Top plate |

| No. | Part name | Procedure | Remarks |
|-----|---------------------------|---|---|
| 2 | Discharge
port cabinet | Detachment Carry out work of 1 of ①. Remove screws for the discharge port cabinet and the partition board. (ST1T Ø4 × 8, 4 pcs.) Remove screws for the discharge port cabinet and the bottom plate. (Hexagonal screw Ø4 × 10, 2 pcs.) Remove screws for the discharge cabinet and the motor base. (ST1T Ø4 × 8, 2 pcs.) Remove screw for the discharge cabinet and the heat exchanger. (ST1T Ø4 × 8, 1 pc.) Remove screws for the discharge port cabinet and the fin guard. (Hexagonal screw Ø4 × 10, 2 pcs.) | Motor base Discharge port cabinet Heat exchanger Partition board Fin guard |
| 3 | Side cabinet | Carry out work of 1 of ①. Remove the screws which fix the inverter assembly and the side cabinet. (ST1T Ø4 × 8, 2 pcs.) Remove the screws for the side cabinet and the valve fixing plate. (ST1T Ø4 × 8, 2 pcs.) Remove screws for the side cabinet and the piping panel (Rear). (Hexagonal screw Ø4 × 10, 2 pcs.) Remove screw for the side cabinet and the bottom plate. (Hexagonal screw Ø4 × 10, 1 pc.) Remove screws for the side cabinet and the fin guard (Heat exchanger). (Hexagonal screw Ø4 × 10, 5 pcs.) | Inverter assembly Side cabinet Valve fixing plate |

| No. | Part name | Procedure | Remarks |
|------------|--|--|--|
| No. | Part name Replacement of electric parts | Procedure 1. Control P.C. board 1) Carry out work of 1 of ①. WARNING Never disassemble the inverter for 1 minute after power supply has been turned off because an electric shock may be caused. 2) Remove the connectors connected to the control P.C. board. (Indoor power supply, Temperature sensor, PMV coil, 4-way valve coil, Compressor case thermo, Fan motor) • Unlock the lock of the housing part and then remove the connectors. 3) Remove the lead wires connected to the control P.C. board. Compressor lead U: CN200 Red V: CN201 White W: CN202 Black Reactor cord CN05 White CN06 White 4) Remove the earth wire from the control P.C. board. (Trust B tight screw Ø4 × 6, 1 pc.) 5) Remove the fixing screws of the control P.C. board. (Screw with collar for fixing | Control P.C. board Upper fan motor Compressor case thermo. Lower fan motor Temperature sensor PMV coil Indoor power supply P.C. board fixing screw (9 positions) Element fixing screws (9 positions) |
| | | 6) Remove the control P.C. board. (Supporter: 5 positions) NOTE: Be careful to take out because there is sealing material for the heat sink. 7) Replace the control P.C. board with a new one. NOTE: • Be sure not to confuse for Compressor lead V (CN201 White), Reactor lead CN05 and CN06. • Be sure not to come-off of the insulating sheet. | Insulating sheet Control P.C. board Sealing material |

| No. | Part name | Procedure | Remarks |
|-----|---|---|---|
| 4 | Replacement of electric parts (Continued) | 2. Reactor 1) Carry out work of 1 of ①. 2) Remove the reactor lead connected to the control P.C. board. CN05 White, CN06 White 3) Cut the bundling band which bundled the compressor lead and fan motor lead. 4) Remove the reactor. (Trust B tight screw, Ø4 × 6, 2 pcs.) 5) Replace the reactor with a new one. NOTE: Be sure to bundle the removed bundling band with the bundling band on the market. Be careful so that the fan motor lead does not come to contact with the reactor body. | Bundling band (Compressor lead, Reactor lead) Control P.C. board Reactor lead Reactor lead Reactor body Bundling band (Compressor lead, Reactor lead) Fan motor lead Bundling band (Fan motor lead, Reactor lead) |

| No. | Part name | Procedure | Remarks |
|-----|-----------|--|---|
| (5) | Fan motor | Carry out works of item 1 of ① and work of ②. Remove the flange nut fixing the fan motor and the propeller fan. The flange nut is loosened by turning it clockwise. (When tightening it, turn it counterclockwise.) Remove the propeller fan. | Propeller fan Loosened by turning clockwise |
| | | 4) Remove the connector for the fan motor from the inverter. (Remove the ferrite core of the lower fan motor because it is used.) 5) Remove the connector for the fan motor from the inverter. | Flange/nut |
| | | Shemove the fan motor lead from the fan motor lead fixed rubber of the penetrated part of the partition board. Remove the fixing service (4 pieces each). | Propeller fan |
| | | Remove the fixing screws (4 pieces each) while supporting the fan motor so that it does not fall down. * Cautions for assembling of fan motor | |
| | | Tighten the flange nut with 4.95N•m (50kgf•cm). Adjust length of the fan motor lead wire at | |
| | | the fan motor lead fixed rubber so that the fan motor lead is not slackened; otherwise the fan motor lead may come to contact with the propeller fan. | Connector of upper, fan motor |
| | | Attach the fan motor lead fixed rubber to the partition board so that the projection is set at the refrigerating cycle side. | |
| | | Be sure so that the rector body does not contact with the fan motor lead. Be sure to bundle the removed bundling band with the bundling band on the | Connector of lower fan motor |
| | | market. • Necessarily attach the ferrite core of the lower fan motor again. (Fix it with bundling band on the market.) | Ferrite core of lower fan motor |
| | | REQUIREMENT | |
| | | Be sure to fix the fan motor lead to the motor base using the metal band of the motor base so that the fan motor lead does not come to contact with the propeller fan. | Fan motor lead fixed rubber |
| | | | Projection/Refrigerating cycle side |
| | | Refrigerating cycle side | Fanmotor |

Part name **Procedure** Remarks 1. Removal of defective compressor 6 Compressor Piping panel (Front) Compressor 1) Recover the refrigerant gas. lead 2) Carry out work of item 1 of ① and work of 3) Remove the piping panel (Front). Remove the piping panel (Front) and screws of the bottom plate. Piping panel (Rear) (Hexagonal screw $\emptyset 4 \times 10$, 2 pcs.) Bundling band Pipe cover Remove screw of the piping panel (Front) (For thermal proof) and the piping panel (Rear). (Hexagonal screw Ø4 × 10, 1 pc.) Compressor lea 4) Remove the piping panel (Rear). Remove the piping panel (Rear) and screws of the bottom plate. (Hexagonal screw Ø4 × 10, 2 pcs.) impressor case thermo. 5) Remove the sound-insulation plate. (Upper, rolling in, rolling out) Control P.C. board 6) Remove the terminal cover of the compressor and then remove the compressor lead and the compressor case thermo. 7) Remove TD sensor which is fixed to the discharge pipe. 8) Remove the compressor lead. (Leave the ferrite core as it is attached to the electric parts box.) Control P.C. board U: CN200 Red V: CN201 White Compressor lead W: CN202 Black 9) Using a burner, remove the discharge pipe and the suction pipe which are connected to the compressor. **⚠ WARNING** In case of removing the piping by broiling the welded part with a burner, if there is oil in the Ferrite core pipe, it may burst into flames at the moment that wax melted, so take sufficient care. Remove (Discharge pipe **CAUTION:** Note so that the flame does not catch the 4-way valve and PMV. (A malfunction may be caused.) Suction pipe) 10) Pull off the discharge pipe and the suction pipe of the refrigerating cycle upward. 11) Remove the compressor nuts which fix the compressor to the bottom plate. (3 pcs.) 12) Pull out the compressor toward you. 150 **CAUTION:** As weight of the compressor is 20kg or ompressor nuts more, handle it by 2 workers.

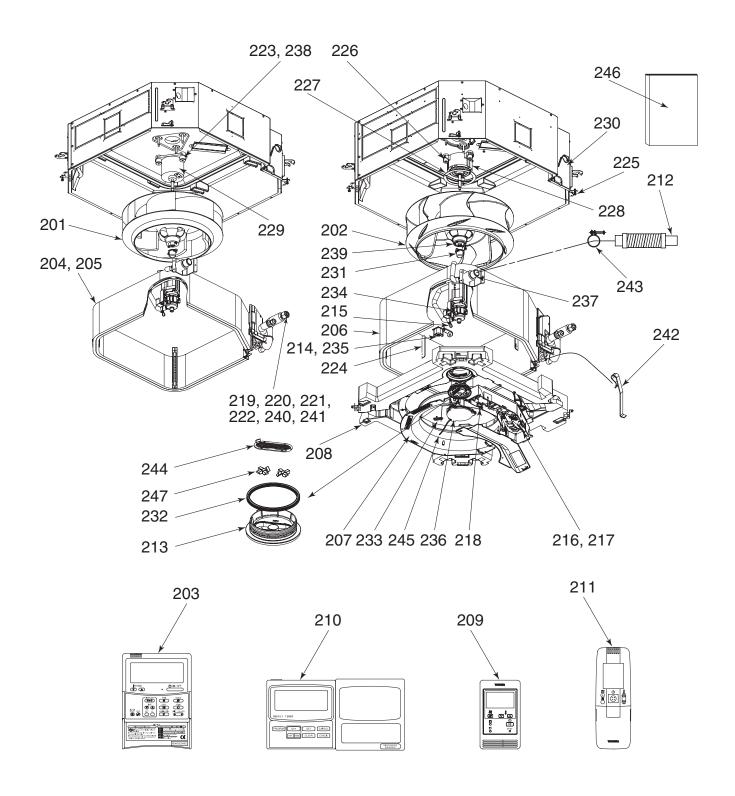
Part name **Procedure** Remarks 6 Compressor 2. Mounting of compressor Compressor 1) Mount the compressor in the reverse lead procedure for removal. (Continued) Compressor lead NOTE: · After replacement of the compressor, be sure to replace the compressor lead. (Repair part code of compressor lead: 43160591) In this time, wrap the ferrite core with the compressor lead wire by 4 times. • As shown in the right figure, mount the Ferrite core 0 to 50 sound-insulation plate (rolling in, rolling (Compressor lead positioning standard) out) by passing through it between the compressor and the piping, and between Put the end of sound-Pass through soundthe piping and the partition board. insulation plate (rolling out) on the other insulation plate (rolling out) between • Fix TD sensor by the bundling band for end at this position. suction pipe and header pipe. heat-proof on the market via the pipe cover so that TD sensor does not directly come to contact with the discharge pipe. Header pipe 3. Vacuuming 1) Connect the vacuum pump to the charge port and the check joint of the gas pipe valve and then drive the vacuum pump. 2) Carry out vacuuming until the vacuum low pressure gauge indicates 1 (mmHg). Discharge pipe Pass through sound-insulation plate (rolling in) NOTE: between compressor and discharge pipe, suction pipe and then put the end of sound-insulation plate on the other end at this position. Before vacuuming, open PMV fully. If PMV is closed, vacuum may be impossible between liquid pipe valve and PMV of the There should be no clearance between soundoutdoor unit. insulation plate (upper) and sound-insulation plate (rolling out). Sound-insulation plate Forced full-opening method of PMV • Turn on the leakage breaker. • Turn on 1 and 3 of Dip switch SW804 on the Cultural rivet control P.C. board of the outdoor unit. Keep pushing SW801 on the control P.C. board of the outdoor unit for 1 second or more. After pushing SW801 for 1 second or more, turn off the leakage breaker within 2 minutes. Insert one side 4. Refrigerant charge under cultural rivet. Sound-insulation plate 1) Add the refrigerant amount determined by (rolling out) the pipe length from the charge port of the valve.

| No. | Part name | Procedure | Remarks |
|-----|-----------|--|---|
| 7 | PMV coil | Detachment Carry out work of item 1 of ①. Turn the coil while pulling upward and then remove the coil from the PMV main unit. Attachment Surely match the positioning projection of the coil with the concave part of PMV main unit and then fix it. | Concave part PMV main unit Positioning projection PMV coil |
| 8 | Fan guard | 1. Detachment 1) Carry out works of item 1 of ① and work of ②. REQUIREMENT To prevent scratch on the product, carry out the work on cardboard, cloth, etc. 2) Remove the discharge port cabinet and then put on it so that the fan guard side directs downward. 3) Remove the hooking claws (8 positions) of the fan guard. 2. Attachment 1) Push the hooking claws (8 positions) with hands from the front side to fix the claws. REQUIREMENT Check that all the hooking claws are fixed at the specified positions. | Fan guard Bell mouth Discharge port cabinet Hooking claw |

14. EXPLODED VIEWS AND PARTS LIST

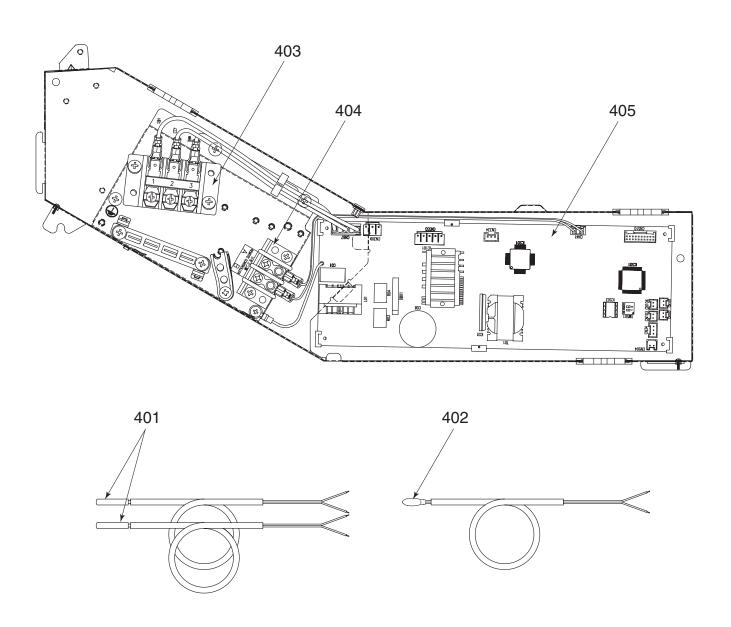
14-1. Indoor Unit

14-1-1. 4-Way Air Discharge Cassette Type RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

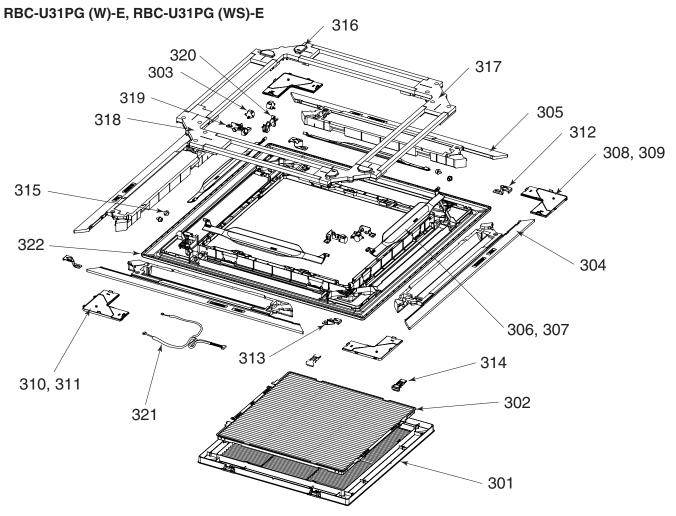


| Location | Part No. | Description | Model Name RAV-SM | | | | |
|----------|-----------|----------------------------------|-------------------|---------|----------|----------|--|
| No. | Part No. | Description | 564UT-E | 804UT-E | 1104UT-E | 1404UT-E | |
| 201 | 43120247 | Fan Ass'y, Turbo, ABS | 1 | 1 | | | |
| 202 | 43120248 | Fan Ass'y, Turbo, ABS | | | 1 | 1 | |
| 203 | 43166011 | Remote Controller, SX-A4EE | 1 | 1 | 1 | 1 | |
| 204 | 4314J399 | Refrigeration Cycle Ass'y | 1 | | | | |
| 205 | 4314J400 | Refrigeration Cycle Ass'y | | 1 | | | |
| 206 | 4314J401 | Refrigeration Cycle Ass'y | | | 1 | 1 | |
| 207 | 43122110 | Bell Mouth, ABS | 1 | 1 | 1 | 1 | |
| 208 | 43172202 | Pan Ass'y, Drain | 1 | 1 | 1 | 1 | |
| 209 | 43166004 | Remote Controller, SX-A11JE2 | 1 | 1 | 1 | 1 | |
| 210 | 43166005 | Remote Controller, EX-W2JE2 | 1 | 1 | 1 | 1 | |
| 211 | 43166006 | Remote Controller, WH-H1JE2 | 1 | 1 | 1 | 1 | |
| 212 | 43170244 | Hose, Drain, 25A | 1 | 1 | 1 | 1 | |
| 213 | 43179144 | LID, Inside | 1 | 1 | 1 | 1 | |
| 214 | 43151290 | Switch, Float, FS-0218-102 | 1 | 1 | 1 | 1 | |
| 215 | 43079249 | Band, Hose | 1 | 1 | 1 | 1 | |
| 216 | 43163057 | Clamp, Down, ABS | 1 | 1 | 1 | 1 | |
| 217 | 43163058 | Clamp, Up, ABS | 1 | 1 | 1 | 1 | |
| 218 | 43089147 | Clamp, Wire, NYLON6 | 3 | 3 | 3 | 3 | |
| 219 | 43047688 | Nut, Flare, 1/2 IN, RoHs | 1 | | | | |
| 220 | 43149352 | Nut, Flare, 5/8 IN | | 1 | | | |
| 221 | 43149353 | Socket, 1/2" | 1 | | | | |
| 222 | 43149354 | Socket, 5/8" | | 1 | | | |
| 223 | 43139137 | Rubber, Cushion | 3 | 3 | | | |
| 224 | 43122099 | Plate, Wind | | | 4 | 4 | |
| 225 | 43197197 | Screw, Fix Panel | 4 | 4 | 4 | 4 | |
| 226 | 43139165 | Rubber, Cushion | | | 3 | 3 | |
| 227 | 43197199 | Washer | | | 1 | 1 | |
| 228 | 4312C038 | Motor, Fan | | | 1 | 1 | |
| 229 | 4312C039 | Motor, Fan | 1 | 1 | | | |
| 230 | 43119497 | Cover Ass'y | 1 | 1 | 1 | 1 | |
| 231 | 43139166 | Cap, Nut | 1 | 1 | 1 | 1 | |
| 232 | 43179147 | Gasket, VMQ | 1 | 1 | 1 | 1 | |
| 233 | 43119498 | Cover, Sensor, ABS | 1 | 1 | 1 | 1 | |
| 234 | 43177010 | Pump Ass'y, MDP-1401 | 1 | 1 | 1 | 1 | |
| 235 | 43151299 | Switch Ass'y, Float, FS-0218-102 | 1 | 1 | 1 | 1 | |
| 236 | 43179145 | LID Ass'y, Outside | 1 | 1 | 1 | 1 | |
| 237 | 43170254 | Socket Ass'y, Drain | 1 | 1 | 1 | 1 | |
| 238 | 43197155 | Washer, 25X6, 5X2T | 3 | 3 | | | |
| 239 | 430497212 | Nut | 1 | 1 | 1 | 1 | |
| 240 | 43147195 | Bonnet, 1/2, IN | 1 | | | | |
| 241 | 43194029 | Bonnet | | 1 | | | |
| 242 | 43019904 | Holder, Sensor, SUS | 2 | 2 | | | |
| 243 | 43179135 | Band, Hose, 37-40 | 1 | 1 | 1 | 1 | |
| 244 | 43179146 | Cover, Glass | 1 | 1 | 1 | 1 | |
| 245 | 43182010 | String | 1 | 1 | 1 | 1 | |
| 246 | 431S8083 | Owner's Manual | 1 | 1 | 1 | 1 | |
| 247 | 43179148 | Glass | 1 | 1 | 1 | 1 | |

RAV-SM564UT-E, RAV-SM804UT-E, RAV-SM1104UT-E, RAV-SM1404UT-E

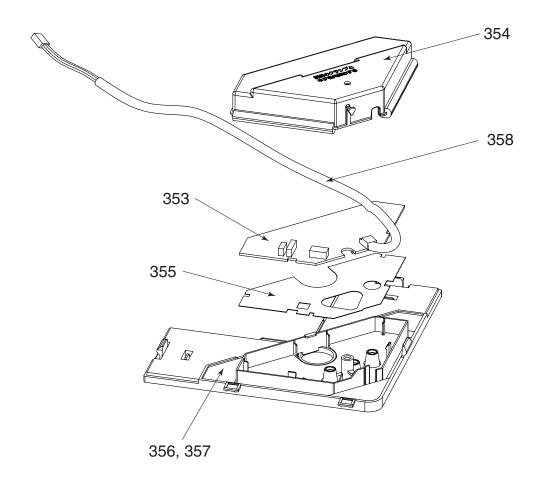


| Location | Part No. | Description | Model Name RAV-SM | | | | | |
|----------|----------|---|-------------------|---------|----------|----------|--|--|
| No. | Part No. | Description | 564UT-E | 804UT-E | 1104UT-E | 1404UT-E | | |
| 401 | 43050425 | Sensor Ass'y, TC (F6), Service | 2 | 2 | 2 | 2 | | |
| 402 | 43050426 | Sensor, TA, Service | 1 | 1 | 1 | 1 | | |
| 403 | 43160565 | Terminal, Block, 3P, AC250V, 20A | 1 | 1 | 1 | 1 | | |
| 404 | 43160568 | Terminal, 2P, AC30V/DC42V, 1A | 1 | 1 | 1 | 1 | | |
| 405 | 4316V355 | P.C. Board Ass'y, 220–240V,
MCC-1570 | 1 | 1 | 1 | 1 | | |



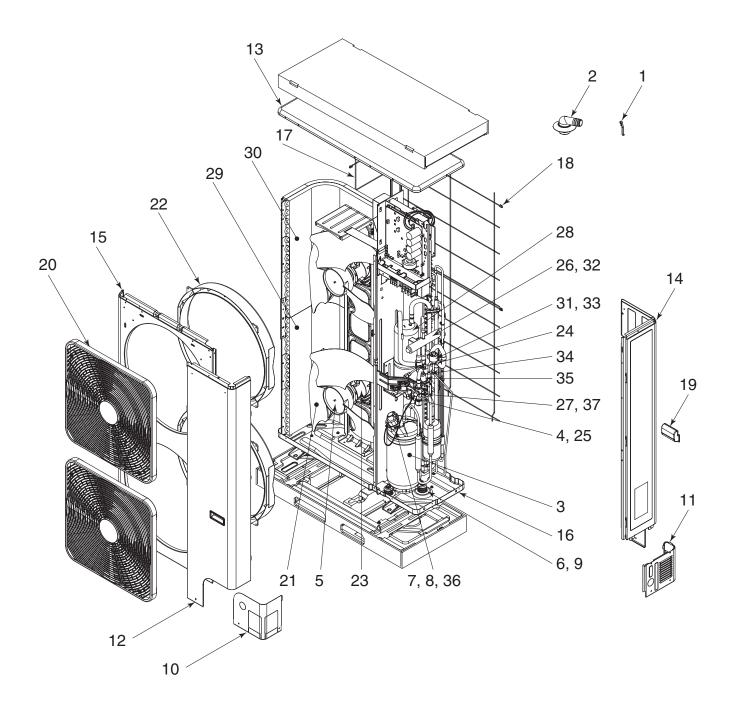
| Location | Part No. | Description | Model Name RBC- | | | |
|----------|----------|-------------------------|-----------------|--------------|--|--|
| No. | | Description | U31PG (W)-E | U31PG (WS)-E | | |
| 301 | 43409207 | Grille, Air Inlet | 1 | 1 | | |
| 302 | 43480017 | Air Filter, ABS + PPNET | 1 | 1 | | |
| 303 | 4302D003 | Motor, Louver, MP24Z3N | 4 | 4 | | |
| 304 | 43407145 | Outlet, Air Form, PS-F | 2 | 2 | | |
| 305 | 43407146 | Outlet, Air Form, PS-F | 2 | 2 | | |
| 306 | 43409212 | Louver, ABS | 4 | | | |
| 307 | 43409216 | Louver, ABS | | 4 | | |
| 308 | 43401037 | Cover, Panel Ass'y | 3 | | | |
| 309 | 43401041 | Cover, Panel Ass'y | | 3 | | |
| 310 | 43401043 | Cover, Panel Ass'y | 1 | | | |
| 311 | 43401047 | Cover, Panel Ass'y | | 1 | | |
| 312 | 43407148 | Plate, Fix, Panel | 2 | 2 | | |
| 313 | 43407149 | Plate, Fix, Panel | 2 | 2 | | |
| 314 | 43407150 | Hook, ABS | 2 | 2 | | |
| 315 | 43407154 | Cap, AXIS, POM | 4 | 4 | | |
| 316 | 43403010 | Cover Ass'y, Motor | 2 | 2 | | |
| 317 | 43403011 | Cover Ass'y | 1 | 1 | | |
| 318 | 43403012 | Cover Ass'y | 1 | 1 | | |
| 319 | 43407155 | Fix, Motor, ABS | 2 | 2 | | |
| 320 | 43407156 | Fix, Motor, ABS | 2 | 2 | | |
| 321 | 43460125 | Lead, Motor | 1 | 1 | | |
| 322 | 43400077 | Panel, Front, PS (W) | 1 | 1 | | |

RBC-AX31U (W)-E, RBC-AX31U (WS)-E



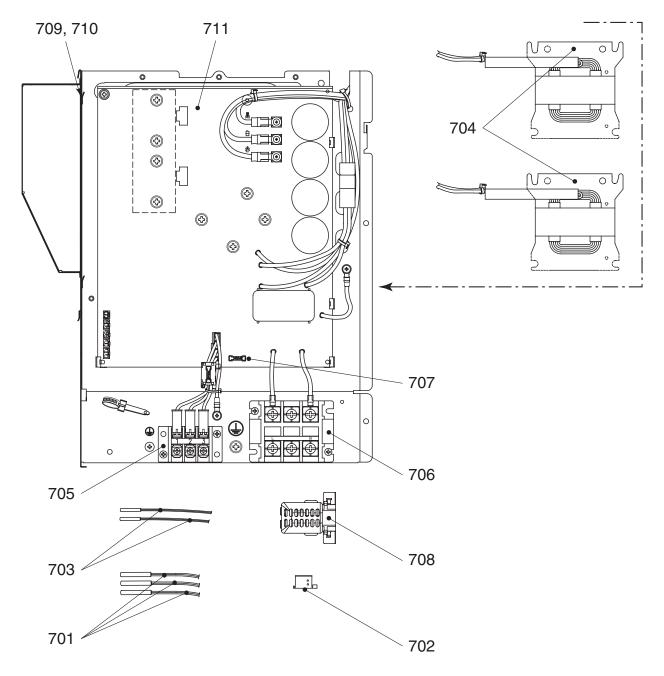
| Location | Part No. | Description | Model Name RBC- | | |
|----------|----------|-----------------------------------|-----------------|--------------|--|
| No. | Part No. | Description | AX31U (W)-E | AX31U (WS)-E | |
| 353 | 43459011 | P.C. Board Ass'y, Remote Reciever | 1 | 1 | |
| 354 | 43462010 | Cover, WRS, ABS | 1 | 1 | |
| 355 | 43461006 | Sheet, PC | 1 | 1 | |
| 356 | 43108018 | Cover, Panel, WRS | 1 | | |
| 357 | 43108019 | Cover, Panel, WRS | | 1 | |
| 358 | 43460126 | Lead | 1 | 1 | |

14-2. Outdoor Unit
RAV-SP1104AT-E, RAV-SP1404AT-E / RAV-SP1104ATZ-E, RAV-SP1404ATZ-E /
RAV-SP1104ATZG-E, RAV-SP1404ATZG-E



| Location | De at At | 5 | Model Name RAV-SP | | | | | |
|----------|----------|---------------------------------------|-------------------|----------|-----------|-----------|------------|------------|
| No. | Part No. | Description | 1104AT-E | 1404AT-E | 1104ATZ-E | 1404ATZ-E | 1104ATZG-E | 1404ATZG-E |
| 1 | 43019904 | Holder, Sensor, SUS | 3 | 3 | 3 | 3 | 3 | 3 |
| 2 | 43032441 | Nipple, Drain | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 | 43041794 | Compressor, DA422A3F-25M | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 43047246 | Bonnet, 3/8 IN | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | 43047669 | Nut, Flange | 2 | 2 | | | | |
| 5 | 43197164 | Nut, Flange, SUS304-WSB | | | 2 | 2 | 2 | 2 |
| 6 | 43049739 | Cushion, Rubber | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 | 43050407 | Thermostat, Bimetal | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | 43063317 | Holder, Thermostat | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | 43097212 | Nut | 3 | 3 | | | | |
| 9 | 43197174 | Nut, Comp., SWCH10R | | | 3 | 3 | 3 | 3 |
| 10 | 43100437 | Panel, Front, Piping | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | 43100438 | Panel, Back, Piping | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | 43100439 | Panel, Front | 1 | 1 | 1 | 1 | 1 | 1 |
| 13 | 43100440 | Plate, Roof | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | 43100441 | Panel, Side | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | 43100442 | Panel, Air Outlet | 1 | 1 | 1 | 1 | 1 | 1 |
| 16 | 43100443 | Base Ass'y | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | 43107274 | Guard, Fin, Side | 1 | 1 | 1 | 1 | 1 | 1 |
| 18 | 43107275 | Guard, Fin, Back | 1 | 1 | 1 | 1 | 1 | 1 |
| 19 | 43107276 | Hanger, PP | 3 | 3 | 3 | 3 | 3 | 3 |
| 20 | 43109422 | Guard, Fan, PP | 2 | 2 | 2 | 2 | 2 | 2 |
| 21 | 43120244 | Fan, Propeller, PB521, SAN-GF20 | 2 | 2 | 2 | 2 | 2 | 2 |
| 22 | 43122113 | Bell, Mouth, PP | 2 | 2 | 2 | 2 | 2 | 2 |
| 23 | 4312C037 | Motor, Fan, ICF-280-A100-1 | 2 | 2 | 2 | 2 | 2 | 2 |
| 24 | 43146676 | Joint, Check | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | 43146686 | Valve, Packed, 9.52 | 1 | 1 | 1 | 1 | 1 | 1 |
| 26 | 43146687 | Valve, 4-Way, STF-0401G | 1 | 1 | 1 | 1 | 1 | 1 |
| 27 | 43146724 | Valve, Ball, SBV-JA5GTC-1, Rohs | 1 | 1 | 1 | 1 | 1 | 1 |
| 28 | 43148170 | Accumulator Ass'y, 2.5L | 1 | 1 | 1 | 1 | | |
| 28 | 43148188 | Accumulator, 2.5L | | | | | 1 | 1 |
| 29 | 4314G266 | Condenser Ass'y, Down | 1 | 1 | | | | |
| 29 | 4314G267 | Condenser Ass'y, Down | | | 1 | 1 | | |
| 29 | 4314G268 | Condenser Ass'y, Down | | | | | 1 | 1 |
| 30 | 4314G269 | Condenser Ass'y, Up | 1 | 1 | | | | |
| 30 | 4314G270 | Condenser Ass'y, Up | | | 1 | 1 | | |
| 30 | 4314G271 | Condenser Ass'y, Up | | | | | 1 | 1 |
| 31 | 4314N023 | Valve, Plus, Modulaing,
UKV-25D100 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | 4314N024 | Coil, Valve, 4-Way,
VHV-01AP552B1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | 4314N025 | Coil, PMV, UKV-A038 | 1 | 1 | 1 | 1 | 1 | 1 |
| 34 | 4314Q031 | Strainer, DIA 9.52, C1220T-H | 1 | 1 | 1 | 1 | 1 | 1 |
| 35 | 4314Q032 | Strainer | 1 | 1 | 1 | 1 | 1 | 1 |
| 36 | 43160591 | Lead Ass'y, Compressor | 1 | 1 | 1 | 1 | 1 | 1 |
| 37 | 43194029 | Bonnet | 1 | 1 | 1 | 1 | 1 | 1 |

RAV-SP1104AT-E, RAV-SP1404AT-E / RAV-SP1104ATZ-E, RAV-SP1404ATZ-E / RAV-SP1104ATZG-E, RAV-SP1404ATZG-E



| Location | Dowt No. | Part No. | Model Name RAV-SP | | | | | |
|----------|----------|---------------------------------|-------------------|----------|-----------|-----------|------------|------------|
| No. | Part No. | Description | 1104AT-E | 1404AT-E | 1104ATZ-E | 1404ATZ-E | 1104ATZG-E | 1404ATZG-E |
| 701 | 43050425 | Sensor Ass'y, TC (F6), Service | 3 | 3 | 3 | 3 | 3 | 3 |
| 702 | 43063325 | Holder, Sensor, 6 - 6.35, 8 | 1 | 1 | 1 | 1 | 1 | 1 |
| 703 | 43150319 | Sensor Ass'y, TD (F4), Service | 2 | 2 | 2 | 2 | 2 | 2 |
| 704 | 43158190 | Reactor, CH-62-ZT | 2 | 2 | 2 | 2 | 2 | 2 |
| 705 | 43160565 | Terminal Block, 3P, AC250V, 20A | 1 | 1 | 1 | 1 | 1 | 1 |
| 706 | 43160581 | Terminal, 3P, 60A | 1 | 1 | 1 | 1 | 1 | 1 |
| 707 | 43160589 | Fuse, AC250V, 10A | 1 | 1 | 1 | 1 | 1 | 1 |
| 708 | 43163055 | Holder, Sensor | 1 | 1 | 1 | 1 | 1 | 1 |
| 709 | 43163059 | Spacer (Bush), P.C. Board | 1 | 1 | 1 | 1 | 1 | 1 |
| 710 | 43163060 | Spacer (Collar), P.C. Board | 1 | 1 | 1 | 1 | 1 | 1 |
| 711 | 4316V357 | P.C. Board Ass'y, MCC-1571 | 1 | 1 | 1 | 1 | 1 | 1 |

WARNINGS ON REFRIGERANT LEAKAGE

Check of Concentration Limit

The room in which the air conditioner is to be installed requires a design that in the event of refrigerant gas leaking out, its concentration will not exceed a set limit.

The refrigerant R410A which is used in the air conditioner is safe, without the toxicity or combustibility of ammonia, and is not restricted by laws to be imposed which protect the ozone layer. However, since it contains more than air, it poses the risk of suffocation if its concentration should rise excessively. Suffocation from leakage of R410A is almost non-existent. With the recent increase in the number of high concentration buildings, however, the installation of multi air conditioner systems is on the increase because of the need for effective use of floor space, individual control, energy conservation by curtailing heat and carrying power etc.

Most importantly, the multi air conditioner system is able to replenish a large amount of refrigerant compared with conventional individual air conditioners. If a single unit of the multi conditioner system is to be installed in a small room, select a suitable model and installation procedure so that if the refrigerant accidentally leaks out, its concentration does not reach the limit (and in the event of an emergency, measures can be made before injury can occur).

In a room where the concentration may exceed the limit, create an opening with adjacent rooms, or install mechanical ventilation combined with a gas leak detection device.

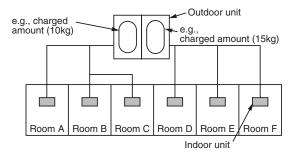
The concentration is as given below.

$$\label{eq:total_state} \begin{split} & \underline{ \mbox{Total amount of refrigerant (kg)} } \\ & \underline{ \mbox{Min. volume of the indoor unit installed room (m³)} } \\ & \leq \mbox{Concentration limit (kg/m³)} \end{split}$$

The concentration limit of R410A which is used in multi air conditioners is 0.3kg/m³.

NOTE 1:

If there are 2 or more refrigerating systems in a single refrigerating device, the amounts of refrigerant should be as charged in each independent device.



For the amount of charge in this example:

The possible amount of leaked refrigerant gas in rooms A, B and C is 10kg.

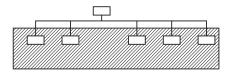
The possible amount of leaked refrigerant gas in rooms D, E and F is 15kg.

Important

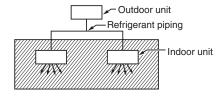
NOTE 2:

The standards for minimum room volume are as follows.

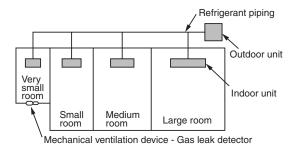
(1) No partition (shaded portion)



(2) When there is an effective opening with the adjacent room for ventilation of leaking refrigerant gas (opening without a door, or an opening 0.15% or larger than the respective floor spaces at the top or bottom of the door).

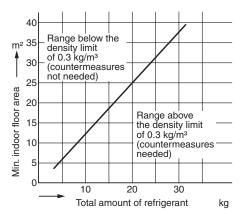


(3) If an indoor unit is installed in each partitioned room and the refrigerant piping is interconnected, the smallest room of course becomes the object. But when a mechanical ventilation is installed interlocked with a gas leakage detector in the smallest room where the density limit is exceeded, the volume of the next smallest room becomes the object.



NOTE 3:

The minimum indoor floor area compared with the amount of refrigerant is roughly as follows: (When the ceiling is 2.7m high)



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